STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

Request For Bids For Construction Services

Two-Stage Bidding Process

Stage II – General Bidder's List
Invitation to Bid

August 5, 2005

Sewer Line Replacement
Utah State Hospital

Provo, Utah

DFCM Project No. 05186420

Nolte Engineering

TABLE OF CONTENTS

Current copies of the following documents are hereby made part of these contract documents by reference. These documents are available on the DFCM web site at http://dfcm.utah.gov or are available upon request from DFCM:

DFCM General Conditions dated May 25, 2005
DFCM Application and Certificate for Payment dated May 25, 2005

Technical Specifications:
Drawings:

The Agreement and General Conditions dated May 25, 2005 have been updated from versions that were formally adopted and in use prior to this date. The changes made to the General Conditions are identified in a document entitled Revisions to General Conditions that is available on DFCM's web site at http://dfcm.utah.gov

INVITATION TO BID

ONLY CONTRACTORS PREVIOUSLY SHORT-LISTED DURING STAGE I ARE ALLOWED TO BID ON THIS PROJECT

The State of Utah - Division of Facilities Construction and Management (DFCM) is requesting bids for the construction of the following project:

SEWER LINE REPLACEMENT - UTAH STATE HOSPITAL, PROVO, UTAH
PROJECT NO: 05186420

Replace main sewer line and install sewer flow meter according to Construction Documents.
Construction cost estimate: $230,000

FIRM NAME	POINT OF CONTACT	PHONE	FAX
ABCO Construction, Inc.	Mr. Reed Price	(435) 723-3770	(435) 723-3311
Ascent Construction	Mr. Dan Wall	(801) 299-1711	(801) 299-0663
Bellock Construction, Inc	Ms. Melody Bellock	(801) 277-7805	(801) 277-5751
Broderick and Henderson Const	Mr. Gary Broderick	(801) 225-9213	(801) 225-4697
Cal Wadsworth Construction	Mr. Cal Wadsworth	(801) 208-1957	(801) 208-1975
Chad Husband Construction, Inc	Mr. Richard Marshall	(801) 972-1146	(801) 886-1784
Comtrol Inc.	Mr. Ralph B. Burk	(801) 561-2263	(801) 561-2305
Darrell Anderson Construction	Mr. James Anderson	(435) 752-6860	(435) 752-7606
Garff Construction	Mr. Phil Henriksen	(801) 973-4248	(801) 972-1928
Gramoll Construction	Mr. Ken Romney	(801) 295-2341	(801) 295-2356
Jepson Construction	Mr. Rick Jepson	(801) 774-8860	(801) 773-8980
Keller Construction	Mr. S. Daniel Hill	(801) 972-1018	(801) 972-1063
McCullough Engineering	Mr. Jim McCullough	(801) 466-4949	(801) 466-4989
Saunders Construction	Mr. Edward Saunders	(801) 782-7830	(801) 782-7856
Spectrum Construction of Utah	Mr. Ronald Snowden	(801) 915-6222	(801) 607-2203
Valley Design and Construction	Mr. Corey King	(801) 927-9542	(801) 927-9544
Wade Payne Construction, Inc.	Mr. Wade Payne	(801) 226-6144	(801) 226-7772

The bid documents will be available on August 5, 2005 from DFCM at 4110 State Office Building, Salt Lake City, Utah 84114, telephone (801)538-3018 and on the DFCM web page at http://dfcm.utah.gov. For questions regarding this project, please contact Kurt Baxter, Project Manager, DFCM, at (801) 538-3174. No others are to be contacted regarding this project.

A **MANDATORY** pre-bid meeting and site visit will be held at 9:00 AM on August 9, 2005 at the State Hospital Facilities Building, 1300 East Center Street, Provo, Utah. All short listed prime contractors wishing to bid on this project must attend this meeting.

Bids must be submitted by 3:00 PM on August 17, 2005 to DFCM, 4110 State Office Building, Salt Lake City, Utah 84114. Bids will be opened and read aloud in the DFCM Conference Room, 4110 State Office Building, Salt Lake City, Utah. Note: Bids must be received at 4110 State Office Building by the specified time. The contractor shall comply with and require all of its subcontractors to comply with the license laws as required by the State of Utah.

A bid bond in the amount of five percent (5%) of the bid amount, made payable to the Division of Facilities Construction and Management on DFCM's bid bond form, shall accompany the bid. The Division of Facilities Construction & Management reserves the right to reject any or all bids or to waive any formality or technicality in any bid in the interest of the State.

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT
MARLA WORKMAN, CONTRACT COORDINATOR

STAGE II BIDDING PROCESS

ONLY CONTRACTORS PREVIOUSLY SHORT-LISTED DURING STAGE I ARE ALLOWED TO BID ON THIS PROJECT

1. Invitational Bid Procedures

Invitation to Bid: DFCM will notify each short-listed firm via e-mail and/or fax when a project is ready for construction services.

Bid Documents: Bidding documents including plans and specifications (if applicable) may be obtained by accessing DFCM's web page at http://dfcm.utah.gov or at DFCM's office 4110 State Office Building, Salt Lake City, Utah 84114.

Mandatory Pre-Bid Site Meeting: If required, the schedule contained in this document will indicate the date, time, and place of the mandatory pre-bid site meeting. At this meeting, contractors will receive additional instructions about the project and have an opportunity to ask questions about project details. If a firm fails to attend a pre-bid site meeting labeled "Mandatory" they will not be allowed to bid on the project.

Written Questions: The schedule contained in this document will indicate the deadline for submitting questions in writing to the DFCM Representative pertaining to this project.

Final Addendum: The schedule contained in this document will indicate the deadline for DFCM issuing the final addendum clarifying questions and changes to the scope of work. Contractors are responsible for obtaining and responding to information contained in the addenda.

Submitting Bids: Bids must be submitted to DFCM, 4110 State Office Building, Salt Lake City, Utah 84114 by the deadline indicated on the schedule contained in this document. Bids submitted after the deadline will not be accepted. Bids will be opened at DFCM on the date, time, and place indicated on the schedule. (Additional information pertaining to bidding is contained later in this document). It is your responsibility to allow for the time needed to park on Capitol Hill as recent construction activity has made the parking more difficult. Identification is required to enter the building.

Subcontractors List: The firm selected for the project must submit a list of all subcontractors by the deadline indicated on the schedule contained in this document. (Additional information pertaining to subcontractor lists is contained later in this document)

2. Drawings and Specifications, Other Contract Documents

Drawings and Specifications, as well as other available Contract Documents, may be obtained as stated in the Notice to Contractors.

3. **Bids**

Before submitting a bid, each bidder shall carefully examine the Contract Documents; shall visit the site of the Work; shall fully inform themselves as to all existing conditions and limitations; and shall include in the bid the cost of all items required by the Contract Documents. If the bidder observes that portions of the Contract Documents are at variance with applicable laws, building codes, rules, regulations or contain obvious erroneous or uncoordinated information, the bidder shall promptly notify the DFCM Representative and the necessary changes shall be accomplished by Addendum.

The bid, bearing original signatures, must be typed or handwritten in ink on the Bid Form provided in the procurement documents and submitted in a sealed envelope at the location specified by the Notice to Contractor's prior to the published deadline for the submission of bids.

Bid bond security, in the amount of five percent (5%) of the bid, made payable to the Division of Facilities Construction and Management, shall accompany bid. THE BID BOND MUST BE ON THE BID BOND FORM PROVIDED IN THE PROCUREMENT DOCUMENTS IN ORDER TO BE CONSIDERED AN ACCEPTABLE BID.

If the bid bond security is submitted on a bid bond form other than the DFCM's required bid bond form, and the bid security meets all other legal requirements, the bidder will be allowed to provide an acceptable bid bond by the close of business on the next business day following notification by DFCM of submission of a defective bid bond security. **Note: A cashier's check cannot be used as a substitute for a bid bond.**

4. **Contract and Bond**

The Contractor's Agreement will be in the form bound in the specifications. The Contract Time will be as indicated in the bid. The successful bidder, simultaneously with the execution of the Contract Agreement, will be required to furnish a performance bond and a payment bond, both bearing original signatures, upon the forms provided in the procurement documents. The performance and payment bonds shall be for an amount equal to one hundred percent (100%) of the Contract Sum and secured from a company that meets the requirements specified in the requisite forms. Any bonding requirements for Subcontractors will be specified in the Supplementary General Conditions.

5. Listing of Subcontractors

Listing of Subcontractors shall be as summarized in the "Instructions and Subcontractor's List Form", which are included as part of these Contract Documents. The subcontractors list shall be delivered to DFCM or faxed to DFCM at (801)538-3677 within 24 hours of the bid opening. Requirements for listing additional subcontractors will be listed in the Contract Documents.

DFCM retains the right to audit or take other steps necessary to confirm compliance with requirements for the listing and changing of subcontractors. Any contractor who is found to not be in compliance with these requirements is subject to a debarment hearing and may be debarred from consideration for award of contract for a period of up to three years.

6. Interpretation of Drawings and Specifications

If any person or entity contemplating submitting a bid is in doubt as to the meaning of any part of the drawings, specifications or other Contract Documents, such person shall submit to the DFCM Representative a request for an interpretation thereof. The person or entity submitting the request will be responsible for its prompt delivery. Any interpretation of the proposed documents will be made only by Addenda duly issued and a copy of such Addenda will be mailed or delivered to each person or entity receiving a set of documents. Neither DFCM nor A/E will be responsible for any other explanations or interpretations of the proposed documents. A/E shall be deemed to refer to the architect or engineer hired by DFCM as the A/E or Consultant for the Project.

7. Addenda

Any Addenda issued during the time of bidding shall become part of the Contract Documents made available to the bidders for the preparation of the bid, shall be covered in the bid, and shall be made a part of the Contract.

8. Award of Contract

The Contract will be awarded as soon as possible to the lowest, responsive and responsible bidder, based on the lowest combination of base bid and acceptable prioritized alternates, provided the bid is reasonable, is in the interests of the State of Utah to accept and after applying the Utah Preference Laws in U.C.A. Title 63, Chapter 56. The DFCM reserves the right to waive any technicalities or formalities in any bid or in the bidding. Alternates will be accepted on a prioritized basis with Alternate 1 being highest priority, Alternate 2 having second priority, etc.

9. **DFCM Contractor Performance Rating**

DFCM will evaluate the performance of the Contractor. This evaluation may include comments from the User. The Contractor will have an opportunity to review and comment on the evaluation. Evaluations, including the Contractor's comments, may be considered in future selection in the evaluation of the Contractor's past performance.

10. **Licensure**

The Contractor shall comply with and require all of its Subcontractors to comply with the license laws as required by the State of Utah.

11. **Right to Reject Bids**

DFCM reserves the right to reject any or all Bids.

12. **Time is of the Essence**

The completion deadline for this project is **November 18, 2005**. Failure to meet the completion deadline may result in a poor performance rating from DFCM which may have a negative impact on your firm's ability to obtain future work with the state of Utah and may also result in liquidated damages being assessed. Time is of the essence in regard to all the requirements of the Contract Documents.

13. **Withdrawal of Bids**

Bids may be withdrawn on written request received from bidders within 24 hours after the bid opening if the contractor has made an error in preparing the bid.

14. **Product Approvals**

Where reference is made to one or more proprietary products in the Contract Documents, but restrictive descriptive materials of one or more manufacturer(s) is referred to in the Contract Documents, the products of other manufacturers will be accepted, provided they equal or exceed

the standards set forth in the drawings and specifications and are compatible with the intent and purpose of the design, subject to the written approval of the A/E. Such written approval must occur prior to the deadline established for the last scheduled addenda to be issued. The A/E's written approval will be in an issued Addendum. If the descriptive material is not restrictive, the products of other manufacturers specified will be accepted without prior approval provided they are compatible with the intent and purpose of the design as determined by the A/E.

15. **Financial Responsibility of Contractors, Subcontractors and Sub-subcontractors**

Contractors shall respond promptly to any inquiry in writing by the DFCM to any concern of financial responsibility of the Contractor, Subcontractor or Sub-subcontractor.

16. **Debarment**.

By submitting a bid, the Contractor certifies that neither it nor its principals, including project and site managers, have been, or are under consideration for, debarment or suspension, or any action that would exclude such from participation in a construction contract by any governmental department or agency. If the Contractor cannot certify this statement, attach to the bid a detailed written explanation which must be reviewed and approved by the DFCM as part of the requirements for award of the Project.

PROJECT SCHEDULE
Stage II = Two-Stage Bidding Process

PROJECT NAME:	**SEWER LINE REPLACEMENT UTAH STATE HOSPITAL**			
DFCM PROJECT #	**05186420**			
Event	**Day**	**Date**	**Time**	**Place**
Stage II Bidding Documents Available	Friday	August 5, 2005	9:00 AM	DFCM, 4110 State Office Bldg, SLC, UT and DFCM web site *
Mandatory Pre-bid Site Meeting	Tuesday	August 9, 2005	9:00 AM	Utah State Hospital Facilities Building 1300 E. Center Street, Provo, UT
Last Day to Submit Questions	Thursday	August 11, 2005	4:00 PM	DFCM, 4110 State Office Bldg, SLC, UT
Final Addendum Issued	Monday	August 15, 2005	4:00 PM	DFCM, 4110 State Office Bldg, SLC, UT or DFCM web site*
Prime Contractors Turn in Bid and Bid Bond / Bid Opening in DFCM Conference Room	Wednesday	August 17, 2005	3:00 PM	DFCM, 4110 State Office Bldg, SLC, UT
Subcontractors List Due	Thursday	August 18, 2005	3:00 PM	DFCM, 4110 State Office Bldg, SLC, UT
Project Completion Date	Friday	November 18, 2005	5:00 PM	

*** DFCM's web site address is http://dfcm.utah.gov**

BID FORM

NAME OF BIDDER _____ DATE _____

To the Division of Facilities Construction and Management
4110 State Office Building
Salt Lake City, Utah 84114

The undersigned, responsive to the "Notice to Contractors" and in accordance with the Request for Bids for the **SEWER LINE REPLACEMENT AT THE UTAH STATE HOSPITAL IN PROVO, UTAH, DFCM PROJECT NO. 05186420** and having examined the Contract Documents and the site of the proposed Work and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of labor, hereby proposes to furnish all labor, materials and supplies as required for the Work in accordance with the Contract Documents as specified and within the time set forth and at the price stated below. This price is to cover all expenses incurred in performing the Work required under the Contract Documents of which this bid is a part:

I/We acknowledge receipt of the following Addenda: _____

For all work shown on the Drawings and described in the Specifications and Contract Documents, I/we agree to perform for the sum of:

_____ DOLLARS ($_____)
(In case of discrepancy, written amount shall govern)

I/We guarantee that the Work will be Substantially Complete by **November 18, 2005** after receipt of the Notice to Proceed, should I/we be the successful bidder, and agree to pay liquidated damages in the amount of **$300** per day for each day after expiration of the Contract Time as stated in Article 3 of the Contractor's Agreement.

This bid shall be good for 45 days after bid opening.

Enclosed is a 5% bid bond, as required, in the sum of _____

The undersigned Contractor's License Number for Utah is _____.

Upon receipt of notice of award of this bid, the undersigned agrees to execute the contract within ten (10) days, unless a shorter time is specified in Contract Documents, and deliver acceptable Performance and Payment bonds in the prescribed form in the amount of 100% of the Contract Sum for faithful performance of the contract. The Bid Bond attached, in the amount not less than five percent (5%) of the above bid sum, shall become the property of the Division of Facilities Construction and Management as liquidated damages for delay and additional expense caused thereby in the event that the contract is not executed and/or acceptable l00% Performance and Payment bonds are not delivered within time set forth.

Type of Organization:

_____
(Corporation, Partnership, Individual, etc.)

Any request and information related to Utah Preference Laws:

_____

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Respectfully submitted,

_____
Name of Bidder

ADDRESS:

_____

_____

_____
Authorized Signature

BID BOND

(Title 63, Chapter 56, U. C. A. l953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ hereinafter referred to as the "Principal," and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ and authorized to transact business in this State and U. S. Department of the Treasury Listed, (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the STATE OF UTAH, hereinafter referred to as the "Obligee," in the amount of $_____ (5% of the accompanying bid), being the sum of this Bond to which payment the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted to Obligee the accompanying bid incorporated by reference herein, dated as shown, to enter into a contract in writing for the _____ _____ Project.

NOW, THEREFORE, THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that if the said principal does not execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the principal, then the sum of the amount stated above will be forfeited to the State of Utah as liquidated damages and not as a penalty; if the said principal shall execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the Principal, then this obligation shall be null and void. It is expressly understood and agreed that the liability of the Surety for any and all defaults of the Principal hereunder shall be the full penal sum of this Bond. The Surety, for value received, hereby stipulates and agrees that obligations of the Surety under this Bond shall be for a term of sixty (60) days from actual date of the bid opening.

PROVIDED, HOWEVER, that this Bond is executed pursuant to provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several seals on the date indicated below, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

DATED this _____ day of _____, 20_____ .

Principal's name and address (if other than a corporation):

_____

_____

By: _____

Title: _____

Principal's name and address (if a corporation):

_____

_____

By: _____

Title: _____

(Affix Corporate Seal)

Surety's name and address:

_____

_____

By: _____

Attorney-in-Fact (Affix Corporate Seal)

STATE OF _____)
) ss.
COUNTY OF _____)

On this ____ day of _____, 20____, personally appeared before me _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.
My Commission Expires: _____
Resides at: _____

_____
NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone:

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

INSTRUCTION AND SUBCONTRACTORS LIST FORM

The three low bidders, as well as all other bidders that desire to be considered, are required by law to submit to DFCM within 24 hours of bid opening a list of **ALL** first-tier subcontractors, including the subcontractor's name, bid amount and other information required by Building Board Rule and as stated in these Contract Documents, on the following basis:

PROJECTS UNDER $500,000 - ALL SUBS $20,000 OR OVER MUST BE LISTED
PROJECTS $500,000 OR MORE - ALL SUBS $35,000 OR OVER MUST BE LISTED

- Any additional subcontractors identified in the bid documents shall also be listed.
- The DFCM Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law.
- List subcontractors for base bid as well as the impact on the list that the selection of any alternate may have.
- Bidder may not list more than one subcontractor to perform the same work.
- Bidder must list "Self" if performing work itself.

LICENSURE:

The subcontractor's name, the type of work, the subcontractor's bid amount, and the subcontractor's license number as issued by DOPL, if such license is required under Utah Law, shall be listed. Bidder shall certify that all subcontractors, required to be licensed, are licensed as required by State law. A subcontractor includes a trade contractor or specialty contractor and does not include suppliers who provide only materials, equipment, or supplies to a contractor or subcontractor.

BIDDER LISTING 'SELF' AS PERFORMING THE WORK:

Any bidder that is properly licensed for the particular work and intends to perform that work itself in lieu of a subcontractor that would otherwise be required to be on the subcontractor list, must insert the term 'Self' for that category on the subcontractor list form. Any listing of 'Self' on the sublist form shall also include the amount allocated for that work.

'SPECIAL EXCEPTION':

A bidder may list 'Special Exception' in place of a subcontractor when the bidder intends to obtain a subcontractor to perform the work at a later date because the bidder was unable to obtain a qualified or reasonable bid under the provisions of U.C.A.Section 63A-5-208(4). The bidder shall insert the term 'Special Exception' for that category of work, and shall provide documentation with the subcontractor list describing the bidder's efforts to obtain a bid of a qualified subcontractor at a reasonable cost and why the bidder was unable to obtain a qualified subcontractor bid. The Director must find that the bidder complied in good faith with State law requirements for any 'Special Exception' designation, in order for the bid to be considered. If awarded the contract, the Director shall supervise the bidder's efforts to obtain a qualified subcontractor bid. The amount of the awarded contract may not be adjusted to reflect the actual amount of the subcontractor's bid. Any listing of 'Special Exception' on the sublist form shall also include amount allocated for that work.

GROUNDS FOR DISQUALIFICATION:

The Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law. Director may withhold awarding the contract to a particular bidder if one or more of the proposed subcontractors are considered by the Director to be unqualified to do the Work or for such other reason in the best interest of the State of Utah. Notwithstanding any other provision in these instructions, if there is a good faith error on the sublist form, at the sole discretion of the Director, the Director may provide notice to the contractor and the contractor shall have 24 hours to submit the correction to the Director. If such correction is submitted timely, then the sublist requirements shall be considered met.

CHANGES OF SUBCONTRACTORS SPECIFICALLY IDENTIFIED ON SUBLIST FORM:

Subsequent to twenty-four hours after the bid opening, the contractor may change its listed subcontractors only after receiving written permission from the Director based on complying with all of the following criteria.

(1) The contractor has established in writing that the change is in the best interest of the State and that the contractor establishes an appropriate reason for the change, which may include, but not is not limited to, the following reasons: the original subcontractor has failed to perform, or is not qualified or capable of performing, and/or the subcontractor has requested in writing to be released.
(2) The circumstances related to the request for the change do not indicate any bad faith in the original listing of the subcontractors.
(3) Any requirement set forth by the Director to ensure that the process used to select a new subcontractor does not give rise to bid shopping.
(4) Any increase in the cost of the subject subcontractor work is borne by the contractor.
(5) Any decrease in the cost of the subject subcontractor work shall result in a deductive change order being issued for the contract for such decreased amount.
(6) The Director will give substantial weight to whether the subcontractor has consented in writing to being removed unless the Contractor establishes that the subcontractor is not qualified for the work.

EXAMPLE:

Example of a list where there are only four subcontractors:

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONT. LICENSE #
ELECTRICAL	ABCD Electric Inc.	$350,000.00	123456789000
LANDSCAPING	"Self"	300,000.00	123456789000
CONCRETE (ALTERNATE #1)	XYZ Concrete Inc	298,000.00	987654321000
MECHANICAL	"Special Exception" (attach documentation)	Fixed at: 350,000.00	(TO BE PROVIDED AFTER OBTAINING SUBCONTRACTOR)

PURSUANT TO STATE LAW - SUBCONTRACTOR BID AMOUNTS CONTAINED IN THIS SUBCNTRACTOR LIST SHALL NOT BE DISCLOSED UNTIL THE CONTRACT HAS BEEN AWARDED.

SUBCONTRACTORS LIST

PROJECT TITLE: _____

Caution: You must read and comply fully with instructions.

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONT. LICENSE #

We certify that:

1. This list includes all subcontractors as required by the instructions, including those related to the base bid as well as any alternates.
2. We have listed "Self" or "Special Exception" in accordance with the instructions.
3. All subcontractors are appropriately licensed as required by State law.

FIRM: _____

DATE: _____ SIGNED BY: _____

NOTICE: FAILURE TO SUBMIT THIS FORM, PROPERLY COMPLETED AND SIGNED, AS REQUIRED IN THESE CONTRACT DOCUMENTS, SHALL BE GROUNDS FOR DFCMS REFUSAL TO ENTER INTO A WRITTEN CONTRACT WITH BIDDER. ACTION MAY BE TAKEN AGAINST BIDDERS BID BOND AS DEEMED APPROPRIATE BY DFCM. ATTACH A SECOND PAGE IF NECESSARY.

FUGITIVE DUST PLAN

The Contractor will fill out the form and file the original with the Division of Air Quality and a copy of the form with the Division of Facilities Construction & Management, prior to the issuance of any notice to proceed.

The Contractor will be fully responsible for compliance with the Fugitive Dust Control Plan, including the adequacy of the plan, any damages, fines, liability, and penalty or other action that results from noncompliance.

Utah Division of Air Quality
April 20, 1999

GUIDANCE THAT MUST BE CONSIDERED IN DEVELOPING AND SUBMITTING A DUST CONTROL PLAN FOR COMPLIANCE WITH R307-309-3, 4, 5, 6, 7

Source Information:

1. Name of your operation (source): provide a name if the source is a construction site.

2. Address or location of your operation or construction site.

3. UTM coordinates or Longitude/Latitude of stationary emission points at your operation.

4. Lengths of the project, if temporary (time period).

5. Description of process (include all sources of dust and fugitive dust). Please, if necessary, use additional sheets of paper for this description. Be sure to mark it as an attachment.

6. Type of material processed or disturbed.

7. Amount of material processed (tons per year, tons per month, lbs./hr., and applicable units).

8. Destination of product (where will the material produced be used or transported, be specific, provide address or specific location), information needed for temporary relocation applicants.

9. Identify the individual who is responsible for the implementation and maintenance of fugitive dust control measures. List name(s), position(s) and telephone number(s).

10. List, and attach copies of any contract lease, liability agreement with other companies that may, or will, be responsible for dust control on site or on the project.

Description of Fugitive Dust Emission Activities
(Things to consider in addressing fugitive dust control strategies.)

1. Type of activities (drilling and blasting, road construction, development construction, earth moving and excavation, handling and hauling materials, cleaning and leveling, etc).

2. List type of equipment generating the fugitive dust.

3. Diagram the location of each activity or piece of equipment on site. Please attach the diagram.

4. Provide pictures or drawings of each activity. Include a drawing of the unpaved/paved road network used to move loads "on" and "off" property.

5. Vehicle miles travels on unpaved roads associated with the activity (average speed).

6. Type of dust emitted at each source (coal, cement, sand, soil, clay, dust, etc.)

7. Estimate the size of the release area at which the activity occurs (square miles). For haul or dirt roads include total miles of road in use during the activity.

Description of Fugitive Dust Emission Controls on Site

Control strategies must be designed to meet 20% opacity or less on site (a lesser opacity may be defined by Approval Order conditions or federal requirements such as NSPS), and control strategies must prevent exceeding 10% opacity from fugitive dust at the property boundary (site boundary) for compliance with R307-309-3.

1. Types of ongoing emission controls proposed for each activity, each piece of equipment, and haul roads.

2. Types of additional dust controls proposed for bare, exposed surfaces (chemical stabilization, synthetic cover, wind breaks, vegetative cover, etc).

3. Method of application of dust suppressant.

4. Frequency of application of dust suppressant.

5. Explain what triggers the use of a special control measure other than routine measures already in place, such as covered loads or measures covered by a permit condition (increase in opacity, high winds, citizen complaints, dry conditions, etc).

6. Explain in detail what control strategies/measures will be implemented off-hours, i.e., Saturdays/Sundays/Holidays, as well as 6 PM to 6 AM each day.

Description of Fugitive Dust Control Off-site

Prevent, to the maximum extent possible, deposition of materials, which may create fugitive dust on public and private paved roads in compliance with R307-309-5, 6, 7.

1. Types of emission controls initiated by your operation that are in place "off" property (application of water, covered loads, sweeping roads, vehicle cleaning, etc.).

2. Proposed remedial controls that will be initiated promptly if materials, which may create fugitive dust, are deposited on public and private paved roads.

Submit the Dust Control Plan to:

Executive Secretary
Utah Air Quality Board
POB 144820
15 North 1950 West
Salt Lake City, Utah 84114-4820

Phone: (801) 536-4000
FAX: (801) 536-4099

Fugitive Dust Control Plan Violation Report

When a source is found in violation of R307-309-3 or in violation of the Fugitive Dust Control Plan, the course must submit a report to the Executive Secretary within 15 days after receiving a Notice of Violation. The report must include the following information:

1. Name and address of dust source.

2. Time and duration of dust episode.

3. Meteorological conditions during the dust episode.

4. Total number and type of fugitive dust activities and dust producing equipment within each operation boundary. If no change has occurred from the existing dust control plan, the source should state that the activity/equipment is the same.

5. Fugitive dust activities or dust producing equipment that caused a violation of R-307-309-3 or the sources dust control plan.

6. Reasons for failing to control dust from the dust generating activity or equipment.

7. New and/or additional fugitive dust control strategies necessary to achieve compliance with R307-309-3, 4, 5, 6, or 7.

8. If it can not be demonstrated that the current approved Dust Control Plan can result in compliance with R307-309-3 through 7, the Dust Control Plan must be revised so as to demonstrate compliance with 307-309-3 through 7. Within 30 days of receiving a fugitive dust Notice of Violation, the source must submit the revised Plan to the Executive Secretary for review and approval.

Submit the Dust Control Plan to:

Executive Secretary
Utah Air Quality Board
POB 144820
15 North 1950 West
Salt Lake City, Utah 84114-4820

Phone: (801) 536-4000
FAX: (801) 536-4099

Attachments: DFCM Form FDR R-307-309, Rule 307-309

CONTRACTOR'S AGREEMENT

FOR:

_____
_____
_____

THIS CONTRACTOR'S AGREEMENT, made and entered into this ____ day of _____, 20__, by and between the DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT, hereinafter referred to as "DFCM", and _____, incorporated in the State of _____ and authorized to do business in the State of Utah, hereinafter referred to as "Contractor", whose address is _____.

WITNESSETH: WHEREAS, DFCM intends to have Work performed at _____ _____.

WHEREAS, Contractor agrees to perform the Work for the sum stated herein.

NOW, THEREFORE, DFCM and Contractor for the consideration provided in this Contractor's Agreement, agree as follows:

ARTICLE 1. SCOPE OF WORK. The Work to be performed shall be in accordance with the Contract Documents prepared by _____ and entitled "_____."

The DFCM General Conditions ("General Conditions") dated May 25, 2005 on file at the office of DFCM and available on the DFCM website, are hereby incorporated by reference as part of this Agreement and are included in the specifications for this Project. All terms used in this Contractor's Agreement shall be as defined in the Contract Documents, and in particular, the General Conditions.

The Contractor Agrees to furnish labor, materials and equipment to complete the Work as required in the Contract Documents which are hereby incorporated by reference. It is understood and agreed by the parties hereto that all Work shall be performed as required in the Contract Documents and shall be subject to inspection and approval of DFCM or its authorized representative. The relationship of the Contractor to the DFCM hereunder is that of an independent Contractor.

ARTICLE 2. CONTRACT SUM. The DFCM agrees to pay and the Contractor agrees to accept in full performance of this Contractor's Agreement, the sum of _____ _____ DOLLARS AND NO CENTS ($_____.00), which is the base bid, and which sum also includes the cost of a 100%

Performance Bond and a 100% Payment Bond as well as all insurance requirements of the Contractor. Said bonds have already been posted by the Contractor pursuant to State law. The required proof of insurance certificates have been delivered to DFCM in accordance with the General Conditions before the execution of this Contractor's Agreement.

ARTICLE 3. TIME OF COMPLETION AND DELAY REMEDY. The Work shall be Substantially Complete within _____ (___) calendar days after the date of the Notice to Proceed. Contractor agrees to pay liquidated damages in the amount of $_____ per day for each day after expiration of the Contract Time until the Contractor achieves Substantial Completion in accordance with the Contract Documents, if Contractor's delay makes the damages applicable. The provision for liquidated damages is: (a) to compensate the DFCM for delay only; (b) is provided for herein because actual damages can not be readily ascertained at the time of execution of this Contractor's Agreement; (c) is not a penalty; and (d) shall not prevent the DFCM from maintaining Claims for other non-delay damages, such as costs to complete or remedy defective Work.

No action shall be maintained by the Contractor, including its or Subcontractor or suppliers at any tier, against the DFCM or State of Utah for damages or other claims due to losses attributable to hindrances or delays from any cause whatsoever, including acts and omissions of the DFCM or its officers, employees or agents, except as expressly provided in the General Conditions. The Contractor may receive a written extension of time, signed by the DFCM, in which to complete the Work under this Contractor's Agreement in accordance with the General Conditions.

ARTICLE 4. CONTRACT DOCUMENTS. The Contract Documents consist of this Contractor's Agreement, the Conditions of the Contract (DFCM General Conditions, Supplementary and other Conditions), the Drawings, Specifications, Addenda and Modifications. The Contract Documents shall also include the bidding documents, including the Notice to Contractors, Instructions to Bidders/Proposers and the Bid/Proposal, to the extent not in conflict therewith and other documents and oral presentations that are documented as an attachment to the contract.

All such documents are hereby incorporated by reference herein. Any reference in this Contractor's Agreement to certain provisions of the Contract Documents shall in no way be construed as to lessen the importance or applicability of any other provisions of the Contract Documents.

ARTICLE 5. PAYMENT. The DFCM agrees to pay the Contractor from time to time as the Work progresses, but not more than once each month after the date of Notice to Proceed, and only upon Certificate of the A/E for Work performed during the preceding calendar month, ninety-five percent (95%) of the value of the labor performed and ninety-five percent (95%) of the value of materials furnished in place or on the site. The Contractor agrees to furnish to the DFCM invoices for materials purchased and on the site but not installed, for which the

Contractor requests payment and agrees to safeguard and protect such equipment or materials and is responsible for safekeeping thereof and if such be stolen, lost or destroyed, to replace same.

Such evidence of labor performed and materials furnished as the DFCM may reasonably require shall be supplied by the Contractor at the time of request for Certificate of Payment on account. Materials for which payment has been made cannot be removed from the job site without DFCM's written approval. Five percent (5%) of the earned amount shall be retained from each monthly payment. The retainage, including any additional retainage imposed and the release of any retainage, shall be in accordance with UCA 13-8-5 as amended. Contractor shall also comply with the requirements of UCA 13-8-5, including restrictions of retainage regarding subcontractors and the distribution of interest earned on the retention proceeds. The DFCM shall not be responsible for enforcing the Contractor's obligations under State law in fulfilling the retention law requirements with subcontractors at any tier.

ARTICLE 6. INDEBTEDNESS. Before final payment is made, the Contractor must submit evidence satisfactory to the DFCM that all payrolls, materials bills, subcontracts at any tier and outstanding indebtedness in connection with the Work have been properly paid. Final Payment will be made after receipt of said evidence, final acceptance of the Work by the DFCM as well as compliance with the applicable provisions of the General Conditions.

Contractor shall respond immediately to any inquiry in writing by DFCM as to any concern of financial responsibility and DFCM reserves the right to request any waivers, releases or bonds from Contractor in regard to any rights of Subcontractors (including suppliers) at any tier or any third parties prior to any payment by DFCM to Contractor.

ARTICLE 7. ADDITIONAL WORK. It is understood and agreed by the parties hereto that no money will be paid to the Contractor for additional labor or materials furnished unless a new contract in writing or a Modification hereof in accordance with the General Conditions and the Contract Documents for such additional labor or materials has been executed. The DFCM specifically reserves the right to modify or amend this Contractor's Agreement and the total sum due hereunder either by enlarging or restricting the scope of the Work.

ARTICLE 8. INSPECTIONS. The Work shall be inspected for acceptance in accordance with the General Conditions.

ARTICLE 9. DISPUTES. Any dispute, PRE or Claim between the parties shall be subject to the provisions of Article 7 of the General Conditions. DFCM reserves all rights to pursue its rights and remedies as provided in the General Conditions.

ARTICLE 10. TERMINATION, SUSPENSION OR ABANDONMENT. This Contractor's Agreement may be terminated, suspended or abandoned in accordance with the General Conditions.

ARTICLE 11. DFCM'S RIGHT TO WITHHOLD CERTAIN AMOUNT AND MAKE USE THEREOF. The DFCM may withhold from payment to the Contractor such amount as, in DFCM's judgment, may be necessary to pay just claims against the Contractor or Subcontractor at any tier for labor and services rendered and materials furnished in and about the Work. The DFCM may apply such withheld amounts for the payment of such claims in DFCM's discretion. In so doing, the DFCM shall be deemed the agent of Contractor and payment so made by the DFCM shall be considered as payment made under this Contractor's Agreement by the DFCM to the Contractor. DFCM shall not be liable to the Contractor for any such payment made in good faith. Such withholdings and payments may be made without prior approval of the Contractor and may be also be prior to any determination as a result of any dispute, PRE, Claim or litigation.

ARTICLE 12. INDEMNIFICATION. The Contractor shall comply with the indemnification provisions of the General Conditions.

ARTICLE 13. SUCCESSORS AND ASSIGNMENT OF CONTRACT. The DFCM and Contractor, respectively bind themselves, their partners, successors, assigns and legal representatives to the other party to this Agreement, and to partners, successors, assigns and legal representatives of such other party with respect to all covenants, provisions, rights and responsibilities of this Contractor's Agreement. The Contractor shall not assign this Contractor's Agreement without the prior written consent of the DFCM, nor shall the Contractor assign any moneys due or to become due as well as any rights under this Contractor's Agreement, without prior written consent of the DFCM.

ARTICLE 14. RELATIONSHIP OF THE PARTIES. The Contractor accepts the relationship of trust and confidence established by this Contractor's Agreement and covenants with the DFCM to cooperate with the DFCM and A/E and use the Contractor's best skill, efforts and judgment in furthering the interest of the DFCM; to furnish efficient business administration and supervision; to make best efforts to furnish at all times an adequate supply of workers and materials; and to perform the Work in the best and most expeditious and economic manner consistent with the interests of the DFCM.

ARTICLE 15. AUTHORITY TO EXECUTE AND PERFORM AGREEMENT. Contractor and DFCM each represent that the execution of this Contractor's Agreement and the performance thereunder is within their respective duly authorized powers.

ARTICLE 16. ATTORNEY FEES AND COSTS. Except as otherwise provided in the dispute resolution provisions of the General Conditions, the prevailing party shall be entitled to reasonable attorney fees and costs incurred in any action in the District Court and/or appellate body to enforce this Contractor's Agreement or recover damages or any other action as a result of a breach thereof.

IN WITNESS WHEREOF, the parties hereto have executed this Contractor's Agreement on the day and year stated hereinabove.

CONTRACTOR: _____

_____
Signature Date

Title: _____

State of _____)
)
County of _____) _____
Please type/print name clearly

On this ____ day of _____, 20____, personally appeared before me, _____, whose identity is personally known to me (or proved to me on the basis of satisfactory evidence) and who by me duly sworn (or affirmed), did say that he (she) is the _____ (title or office) of the firm and that said document was signed by him (her) in behalf of said firm.

_____
Notary Public

(SEAL)

My Commission Expires _____

APPROVED AS TO AVAILABILITY OF FUNDS:

_____
Financial Manager, Date
Division of Facilities Construction and Management

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT

_____
_____ Date
Manager -
Capital _____

APPROVED AS TO FORM:
ATTORNEY GENERAL
May 25, 2005
By: Alan S. Bachman
Asst Attorney General

APPROVED FOR EXPENDITURE:

_____
Division of Finance Date

PERFORMANCE BOND

(Title 63, Chapter 56, U. C. A. 1953, as Amended)

That _____ hereinafter referred to as the "Principal" and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ and authorized to transact business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah, hereinafter referred to as the "Obligee, " in the amount of _____ _____ DOLLARS ($_____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _____ day of _____, 20____, to construct _____ in the County of _____, State of Utah, Project No. _____, for the approximate sum of _____ _____ Dollars ($_____), which Contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall faithfully perform the Contract in accordance with the Contract Documents including, but not limited to, the Plans, Specifications and conditions thereof, the one year performance warranty, and the terms of the Contract as said Contract may be subject to Modifications or changes, then this obligation shall be void; otherwise it shall remain in full force and effect.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the state named herein or the heirs, executors, administrators or successors of the Owner.

The parties agree that the dispute provisions provided in the Contract Documents apply and shall constitute the sole dispute procedures of the parties.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the Provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20_____.

WITNESS OR ATTESTATION:

_____

PRINCIPAL:

_____

By: _____ (Seal)

Title: _____

WITNESS OR ATTESTATION:

_____

SURETY:

_____

By: _____ (Seal)

Attorney-in-Fact

STATE OF _____)
) ss.
COUNTY OF _____)

On this _____ day of _____, 20____, personally appeared before me _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney in-fact of the above-named Surety Company and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.

My commission expires: _____
Resides at: _____

_____
NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

PAYMENT BOND

(Title 63, Chapter 56, U. C. A. l953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ hereinafter referred to as the "Principal," and _____ _____, a corporation organized and existing under the laws of the State of _____authorized to do business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); with its principal office in the City of _____, hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah hereinafter referred to as the "Obligee," in the amount of _____ Dollars ($_____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _____ day of _____, 20____, to construct _____ in the County of _____, State of Utah, Project No. _____ for the approximate sum of _____ _____ Dollars ($_____), which contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall pay all claimants supplying labor or materials to Principal or Principal's Subcontractors in compliance with the provisions of Title 63, Chapter 56, of Utah Code Annotated, l953, as amended, and in the prosecution of the Work provided for in said Contract, then, this obligation shall be void; otherwise it shall remain in full force and effect.

That said Surety to this Bond, for value received, hereby stipulates and agrees that no changes, extensions of time, alterations or additions to the terms of the Contract or to the Work to be performed thereunder, or the specifications or drawings accompanying same shall in any way affect its obligation on this Bond, and does hereby waive notice of any such changes, extensions of time, alterations or additions to the terms of the Contract or to the Work or to the specifications or drawings and agrees that they shall become part of the Contract Documents.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20____.

WITNESS OR ATTESTATION:

_____

PRINCIPAL:

_____

By: _____

(Seal)

Title: _____

WITNESS OR ATTESTATION:

_____

SURETY:

_____

By: _____

Attorney-in-Fact (Seal)

STATE OF _____)
) ss.
COUNTY OF _____)

On this _____ day of _____, 20____, personally appeared before me _____ _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.

My commission expires: _____

Resides at: _____

_____

NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

CHANGE ORDER #_____

CONTRACTOR:

ARCHITECT:

AGENCY OR INSTITUTION:
PROJECT NAME:
PROJECT NUMBER:
CONTRACT NUMBER:
DATE:

CONSTRUCTION CHANGE DIRECTIVE NO.	PROPOSAL REQUEST NO.	AMOUNT		DAYS	
		INCREASE	DECREASE	INCREASE	DECREASE

	Amount	Days	Date
ORIGINAL CONTRACT			
TOTAL PREVIOUS CHANGE ORDERS			
TOTAL THIS CHANGE ORDER			
ADJUSTED CONTRACT			

DFCM and Contractor agree that the terms, contract sum, scope of the Work and time specified in this Change Order shall constitute the full accord and satisfaction, and complete adjustment to the Contract and includes all direct and indirect costs and effects related to, incidental to, and/or reasonably implied from such change in the contract terms, sum, scope of the Work and time.

Contractor:_____
Date

Architect/Engineer:_____
Date

Agency or Institution:_____
Date

DFCM: _____
Date

Funding Verification:_____
Date

CERTIFICATE OF SUBSTANTIAL COMPLETION

PROJECT _____ PROJECT NO: _____

AGENCY/INSTITUTION _____

AREA ACCEPTED _____

The Work performed under the subject Contract has been reviewed on this date and found to be Substantially Completed as defined in the General Conditions; including that the construction is sufficiently completed in accordance with the Contract Documents, as modified by any change orders agreed to by the parties, so that the State of Utah can occupy the Project or specified area of the Project for the use for which it is intended.

The DFCM accepts the Project or specified area of the Project as Substantially Complete and will assume full possession of the Project or specified area of the Project at _____ (time) on _____ (date).

The DFCM accepts the Project for occupancy and agrees to assume full responsibility for maintenance and operation, including utilities and insurance, of the Project subject to the itemized responsibilities and/or exceptions noted below:

_____

_____

_____

A list of items to be completed or corrected is attached hereto. The failure to include an item on it does not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents, including authorized changes thereof.

The Contractor shall complete or correct the Work on the list of items appended hereto within _____ calendar days from the above date of issuance of this Certificate. The amount withheld pending completion of the list of items noted and agreed to shall be: $_____.

_____ by: _____

CONTRACTOR (include name of firm) DATE

_____ by: _____

A/E DATE

_____ by: _____

USING INSTITUTION OR AGENCY DATE

_____ by: _____

DFCM DATE

cc: Parties Noted
DFCM, Director

DFCM

UTAH STATE HOSPITAL
SEWER REPLACEMENT PROJECT

DFCM PROJECT NO. 05186420
DFCM RISK MANAGEMENT NO. I0001

TECHNICAL SPECIFICATIONS

Project Engineer

NOLTE ASSOCIATES, INC.
Consultants/Engineers
6671 South Redwood Rd. Suite 101
West Jordan, Utah 84084
(801) 743-1300

July 2005

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APPENDIX

MANUFACTURER'S SPECIFICATIONS & CUT SHEETS:

MILLTRONICS OPEN CHANNEL METER OCM III
MILLTRONICS ECHOMAX XRS-5 TRANSDUCER

DRAWINGS

DOCUMENT 00310

BID SCHEDULE

PART 1 PROJECT IDENTIFICATION

1.01 Name: **UTAH STATE HOSPITAL SANITARY SEWER REPLACEMENT PROJECT**

1.02 Submitted to: Division of Facilities Construction and Management
4110 State Office Building
Salt Lake City, Utah 84114

PART 2 RELATED REQUIREMENTS

2.01 Section 01025: Measurement and Payment

PART 3 BID SCHEDULE – UTAH STATE HOSPITAL SANITARY SEWER REPLACEMENT (NEXT PAGE)

STATE HOSPITAL SEWER REPLACEMENT BID SCHEDULE

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL
1	4" SDR-35 Sanitary Sewer Pipe	59	LF		
2	8" SDR-35 Sanitary Sewer Pipe	1,136	LF		
3	10" SDR-35 Sanitary Sewer Pipe	918	LF		
4	48" Sanitary Sewer Manhole	4	EA.		
5	60" Sanitary Sewer Manhole	5	EA.		
6	Existing Manhole Abandonment	14	EA.		
7	Existing Sewer Line Tributary Abandonment Verification	1	LS		
8	3" AC Pavement	4,230	SF		
9	4" Median Curb	18	LF		
10	2.5' Curb & Gutter	75	LF		
11	Concrete Cutting	961	LF		
12	Type I Granular Fill - Roadbase	150	CY		
13	3/4" Gravel	477	CY		
14	Sod Replacement	9,000	SF		
15	Palmer Bowlus Flume	1	EA.		
16	Milltronics Transducer & Meter	1	EA.		
17	Water Meter @ Maintenance Shed	1	LS		
	BID TOTAL				

THE FOLLOWING INFORMATION IS ACKNOWLEDGED BY THE BIDDER:

The BIDDER acknowledges that the OWNER may elect to increase or decrease the estimated quantities indicated in the above tables to reflect conditions encountered during installation of facilities.

COMPANY: _____

Signed: _____

Title: _____

Date: _____

- END OF DOCUMENT -

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. Work of this Construction Contract is outlined in the construction drawings sheets 1-7 and comprises newer sewer pipe installation, abandonment of existing sewer infrastructure, replacement of asphaltic concrete, concrete, curb and gutter and flow meter installation.

1.02 CONTRACT METHOD

A. Construct the Work under a unit price bid.

1.03 CONTRACTOR USE OF PREMISES

A. CONTRACTOR shall limit use of premises for Work, for storage, and for access, to allow:

1. Public access along Center Street during construction.

B. Coordinate use of premises under direction of the OWNER.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

END OF DOCUMENT

SECTION 01015

CONTRACT TIME

PART 1 - GENERAL

1.01 COMPLETION DATE SCHEDULE

Time for completion: 60 calendar days.

1.02 SCHEDULE

The following schedule contains specific dates which shall be adhered to and are the last acceptable date unless modified in writing between the Owner and the Contractor. Specific dates, as used herein, shall mean calendar days after the date of the notice to proceed. For the period of time that any portion of the project remains unfinished after the time fixed for completion by these specific dates, the Contractor shall pay to ____ the amount of liquidated damages set forth in Section 00800, SUPPLEMENTARY CONDITIONS, Paragraph 1.08, Amount of Damages for Delay. As required by Section 01310, CONTRACTOR'S CONSTRUCTION SCHEDULE, the Contractor shall furnish to the Owner an acceptable construction schedule to complete the various portions of the project within the time allowed by the specific dates. The Contractor's construction schedule shall reflect the entire contract time defined in this section. Substantial completion as delineated below is defined in Section 00700, GENERAL CONDITIONS, Paragraph 1.01, Definitions.

Substantial completion of all remaining work 10/09/2005

Final Completion 10/23/2005

END OF SECTION

SECTION 01045

MODIFICATIONS TO EXISTING STRUCTURES, PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 SCOPE OF WORK

The Contractor shall furnish all labor, material, equipment and incidentals required to modify, alter and/or convert existing structures as shown or specified and as required for the installation of new mechanical or electrical equipment, piping and appurtenances. Existing piping and equipment shall be removed and dismantled as necessary for the performance of structural and piping alterations in accordance with the requirements herein specified.

1.02 GENERAL

The Contractor shall cut, repair, reuse, excavate, demolish or otherwise remove parts of the existing structures, piping or appurtenances as indicated on the contract drawings, herein specified, or as necessary to permit completion of the work under this contract. The Contractor shall dispose of surplus materials resulting from the above work as specified in Section 02100, SITE PREPARATION. The above work shall include the drilling of holes into existing concrete for the purpose of cutting of holes in masonry or concrete for the installation of pipe, conduits, and other appurtenances. The work shall include all necessary cutting and bending of reinforcing steel, structural steel, or miscellaneous metal work found embedded in the existing structures.

The Contractor shall dismantle and remove all existing equipment, piping and other appurtenances required for the completion of the work. Where called for or required, the Contractor shall cut existing pipelines for the purpose of making connections thereto. Anchor bolts for equipment and structural steel removed shall be cut off 1 in. below the concrete surface except as detailed otherwise. Surface shall be finished as specified in Division 3.

When removing materials or portions of existing structures and when making openings in walls and partitions, the Contractor shall take all precautions and use all necessary barriers and other protective devices so as not to damage the structures beyond the limits necessary for the new work, nor to damage the structures or contents by falling or flying debris.
All work of altering existing structures shall be done at such time and in such manner as will comply with the accepted time schedule. Insofar as possible before any part of the work is started, all tools, equipment, and materials shall be assembled and made ready so that the work can be completed without delay.

Where holes in existing masonry or concrete are required to be sealed, unless otherwise specified, they shall be sealed with grout around the pipe and shall be water tight. The

sides of the openings shall be provided with keyed joints and shall be suitably roughened to furnish a good bond and make a watertight joint. All loose or unsound material adjacent to the opening shall be removed and, if necessary, replaced with new material. The method of placing the seal shall provide a suitable means of releasing entrapped air.

Surfaces of seals visible in the completed work shall be made to match as nearly as possible the adjacent surface.

Nonshrink grout shall be used for setting wall castings and sleeves into existing concrete and elsewhere as shown.

Where necessary or required for the purpose of making connections, the Contractor shall cut existing pipelines in a manner to provide an approved joint. Where required, the Contractor shall weld beads, flanges or provide couplings, as required.

The Contractor shall provide suitable plugs, bulkheads or other means to hold back the flow of water or other liquids, all as required in the performance of the work under this contract.

1.03 MAINTENANCE OF ELECTRICAL SERVICE

The Contractor shall install new electrical service to mechanical equipment as indicated with a minimum of interruption to site services. The Contractor shall inform the Construction Manager in writing, of the Contractor's intention to interrupt the power supply for the purpose of making the required connections at least two weeks in advance of such interruption and shall also give the estimated hours of interruption. In no case shall the Contractor cause an intentional power interruption without written authority from the Construction Manager.

END OF SECTION

SECTION 01050

FIELD ENGINEERING

PART 1 - GENERAL

1.01 CONSTRUCTION STAKING

A. General

The Construction Manager will establish reference bench marks and base lines identified on the drawings. From the information provided, the Contractor shall develop and make such additional surveys as are needed for construction, such as control lines, stakes for pipe locations and other working points, lines, and elevations. Survey work shall be performed under the supervision of a licensed land surveyor or registered civil engineer.

B. Datum

The plane of reference for elevations used in the plans and specifications shall be mean sea level (MSL). Elevations below the plane of reference are designated as "minus" (-) elevations.

C. Horizontal and Vertical Control

From the base line and temporary bench mark described herein and the existing structures, the Contractor shall complete the layout of the work and shall be responsible for all measurements that may be required for execution of the work to the location and limit marks prescribed in the specifications or on the Contract Drawings, subject to such modifications as the Construction Manager may require to meet changed conditions or as a result of necessary modifications to the contract work.

D. Contractor's Layout

The Contractor shall furnish at his own expense, such stakes, equipment, tools, materials, and all labor as required in laying out any parts of the work from the base line and bench marks established by the Construction Manager. It shall be the responsibility of the Contractor to maintain and preserve all base line stakes and other marks established by the Construction Manager until authorized to remove them; and, if such stakes or other marks are destroyed by the Contractor, or through his negligence, prior to their authorized removal, they may be replaced by and at the discretion of the Construction Manager and the expense of replacement shall be borne by the Contractor and will be deducted from any amounts due or to become due to the Contractor.

The Construction Manager may require that work be suspended at any time when location and limit marks established by the Contractor are not reasonably adequate to permit convenient checking of the work.

A minimum notice of 2 working days is required for all staking requests.

END OF SECTION

SECTION 01060

SAFETY AND HEALTH

PART 1- GENERAL

1.01 GENERAL

The work for this project will cause exposure of personnel to wastewater of varying degrees of treatment. The Contractor certifies that he is experienced and qualified to anticipate and meet the safety and health requirements of this project.

Workers involved in the removal, renovation, or installation of equipment within the Utah State Hospital campus may be exposed to disease-producing organisms in wastewater. The Contractor shall require his personnel to observe proper hygienic precautions. Inoculation of workers against sewage borne diseases is recommended.

1.02 SAFETY AND HEALTH REGULATIONS

The Contractor shall comply with Safety and Health Regulations for Construction, promulgated by the Secretary of Labor under Section 107 of the Contract Work Hours and Safety Standards Acts, as set forth in Title 29, Code of Federal Regulations (CFR). Copies of these regulations may be obtained from Labor Building, 14th and Constitution Avenue NW, Washington, DC 20013.

The Contractor shall also comply with the provisions of the Federal Occupational Safety and Health Act (OSHA), as amended.

END OF SECTION

SECTION 01150

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 DESCRIPTION

This section shall define the method to be used to measure the work performed as described in the contract documents.

1.02 DETAILS FOR PAYMENT OF BID ITEMS

A. GENERAL

The amount of work to be done or materials to be furnished under the contract as noted in the Bid Schedule are estimates and are not to be taken as an expression or implied statement that the actual amount of work or materials will correspond to the estimate.

The right is reserved to increase, decrease or entirely eliminate certain items from the work if found desirable or expedient, and the Contractor is cautioned against unbalancing of his bid by prorating his overhead and profit into one or two items only when there are a number of items on the bid. The overhead, indirect charges and profit shall be prorated on all items in the bid.

The Contractor will be allowed no claims for anticipated profits, loss of profits or for damages because of any difference between the estimated and the actual amounts of work done, or materials furnished or used in the completed project.

B. INCLUSIONS

Payment for this schedule shall be a lump sum bid, which payment shall be full compensation for all required work necessary to complete this schedule as outlined in the specifications and shown on the drawings.

Lump sum payment shall be considered full compensation for all direct and indirect costs, overhead, profit, insurance, bonds, taxes, fees, permits and for furnishing all materials, labor, equipment, tools and doing all work as shown on the project drawings, defined in the specifications and as stipulated herein. Bid prices shall include all protective and remedial measures to bring work into compliance with these contract documents.

C. SUBMITTALS

The Contractor shall submit a payment request to the Owner according to their specifications.

1.03 BID ITEMS

A. Bid Items #1 – 3: SDR-35 Sanitary Sewer Pipe

Calculated in linear feet of pipe with corresponding trench excavation. Includes cost of raw pipe material, equipment, machinery and labor to lay and excavate associated trench. Concrete cutting not included.

B. Bid Items #4 & 5: 48" & 60" Sanitary Sewer Manholes

Calculated in price per unit. Price includes materials, labor, equipment, machinery, etc., for excavation, backfill around manhole, manhole rings, covers, final grading and matching existing surface conditions.

C. Bid Item #6: Existing Manhole Abandonment

Calculated in price per unit. Price includes materials, labor, use of equipment, machinery, etc., in extracting topmost manhole ring, filling manhole with road base, compacting road base and covering over, matching existing surface conditions.

D. Bid Item #7: Existing Sewer Line Tributary Abandonment Verification

Calculated as a lump sum. Price includes labor, equipment, materials, etc. in verifying that all tributary lines to existing lines to be abandoned do not have live sewer connections to them.

E. Bid Item #8: 3" AC Pavement

Calculated in square feet. Price includes the cost of materials, use of all equipment used to place, roll and compact asphalt in place and match existing surface conditions.

F. Bid Items #9 & 10: 4" Median Curb & 2.5' Curb & Gutter

Calculated in linear feet. Price includes the cost of materials, labor and use of all equipment used, etc. to place and form to match existing conditions median curb and curb and gutter disturbed.

G. Bid Item #11: Concrete Cutting

Calculated in linear feet. Price includes the cost of materials, labor and use of all equipment used, etc. to cut asphalt concrete and Portland cement concrete from roadway, curb and gutter.

H. Bid Items #12 & 13: Road base & ¾"Gravel

Calculated in cubic yards. Price includes cost of materials, transporting, labor and use of all equipment, etc. to place road base where necessary in the project. Road base shall not be placed as backfill under non-paved areas.

I. Bid Item #14: Sod Replacement

Calculated in square feet. Price includes cost of materials, transporting, labor and use of all equipment, etc. to place sod in any applicable disturbed area in the project. Road base shall not be placed in under areas covered with sod or grass.

J. Bid Item #15 & 16: Palmer Bowlus Flume & Milltronics Transducer & Meter

Calculated as a lump sum. Price includes cost of materials, delivery, installation and calibration with onsite help from manufacturer of transducer and open channel meter, installation of meter at Excel House, conduit between meter and transducer under road and grass, etc.

K. Bid Item #17: Water Meter at Maintenance Shed

Calculated as lump sum. Coordinate installation with DFCM and Provo City. Includes materials, labor, delivery, use of equipment used to install water meter below ground at the State Hospital maintenance shop.

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.01 PRECONSTRUCTION MEETING

A preconstruction meeting will be held within ten working days of award of the contract. The purpose of the meeting will be to discuss the various requirements of the specifications and the Contractor's responsibilities with regard to process control, schedule, submittals, traffic control, and safety. The Contractor shall not start construction work until after the preconstruction meeting.

1.02 STATUS MEETINGS

Construction progress meetings shall be held throughout the construction period from the time the Contractor begins work until the acceptance of the work by the DFCM on an as-needed basis. The meeting will be attended by the Construction Manager, and representatives of the DFCM. The Contractor shall be represented by his designated construction manager and superintendent and representatives of any major subcontractor whose work will be discussed at the meeting.

The purpose of the meeting shall be as follows:

A. Review of progress of the work during the preceding month and the job to date for compliance with the approved construction schedule as described in Section 01310, CONTRACTOR'S CONSTRUCTION SCHEDULE.

B. Discuss work and coordination of activities that will be required for the completion of all work scheduled for the following month.

C. Discuss additional measures required to bring the progress of the work into compliance with the approved schedule if required to satisfy the provisions of the contract.

D. Review status of submittals, change orders, directives, and equipment delivery dates.

E. Any additional items of concern to the District or Construction Manager.

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

A. Temporary Utilities

B. Sanitary Facilities

C. Barriers and Enclosures

D. Protection of Installed Work

E. Dust, Water and Noise Control

F. Construction Cleaning

G. Project Identification

H. Traffic Regulation

I. Removal

1.02 RELATED REQUIREMENTS

A. Section 01700- Contract Closeout: Final cleaning.

1.03 TEMPORARY UTILITIES

Not used.

1.04 SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Owner has no facilities available.

1.05 BARRIERS AND ENCLOSURES

A. Provide as required to prevent public entry to construction are and to protect existing facilities and adjacent properties from damage from construction operations.

B. Provide barricades as required by governing authorities for public rights-of-way and for public access to existing building(s).

C. Provide barriers around trees and plants designated to remain. Protect against vehicular traffic, stored materials, dumping, chemically injurious materials, and puddling or continuous running water.

1.06 PROTECTION OF INSTALLED WORK

A. Provide temporary protection for installed products. Control traffic in immediate area to minimize damage. Repair or replace at Owner's option any installed work damaged by traffic, the public, or Work operations.

1.07 DUST, WATER AND NOISE CONTROL

A. Surface Water, Erosion and Sediment Control:

1. Surface water shall be controlled so that the construction area is not allowed to become wet from runoff from adjacent areas. Surface water shall be directed away from these areas but not directed toward adjacent property, buildings, or any improvement that may be damaged by water. Surface water shall not be allowed to enter sanitary sewers.

2. Maintain excavations free of water. Provide and operate pumping equipment.

3. Prevent erosion and sedimentation.

4. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.

B. Dust Control:

1. Dust control measures shall be implemented by application of water to all work areas, storage areas, haul and access roads, or other areas affected by construction.

2. All work shall be in compliance with the Federal, State, and local air pollution standards, and not cause a hazard or nuisance to personnel and the public in the vicinity of the work.

3. Provide and operate at least 1 mobile tank sprinkling unit or other positive means to prevent air-borne dust from dispersing into atmosphere.

4. Execute work by methods to minimize raising dust from construction operations.

C. Noise Control:

1. Execute construction between the hours of 8:00 A.M. and 5:00 P.M. unless otherwise approved by Owner.

1.08 CONSTRUCTION CLEANING

A. All public and private areas used as haul roads shall be continuously maintained and cleaned of all construction caused debris such as mud, sand, gravel, soils, pavement fragments, sod, etc. Care shall be taken to prevent spillage on haul routes. Any such spillage shall be removed immediately and the area cleaned.

B. Public roads shall be maintained in accordance with applicable ordinances and regulations.

C. Throughout all phases of construction, including suspension of work, and until final acceptance of the project, the Contractor shall keep the work site clean and shall remove daily all refuse, dirt, damaged materials, unusable materials, and all other trash or debris that he has created from his construction activities.

D. Materials and equipment shall be removed from the site as soon as they are no longer necessary; and upon completion of the work and before final inspection, the entire worksite shall be cleared of equipment, unused materials, and rubbish so as to present a satisfactory clean and neat appearance. All cleanup costs shall be included in the Contractor's Bid.

1.09 TRAFFIC REGULATION

A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and Owner's operations.

B. Monitor parking of construction personnel's vehicles. Maintain vehicular access to and through parking areas.

C. Prevent parking on or adjacent to access roads or in non-designated areas.

D. Provide trained and equipped flagmen to regulate traffic when construction operations or traffic encroach on public traffic lanes. Provide control in accordance with local authority having jurisdiction.

E. Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

F. Consult with authorities when necessary, establish public thoroughfares to be used for haul routes and site access.

G. Confine construction traffic to haul routes and designated construction limits.

H. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.

I. At approaches to site and on site, install at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.

J. Relocate as Work progresses, to maintain effective traffic control.

K. Post-mounted traffic control and informational signs, traffic cones and drums, and flagman equipment as required and approved by local jurisdictions.

L. Where local jurisdictions have no requirements, construct and erect according to "Manual on Uniform Traffic Control Devices for Streets and Highways" (MUTCD).

M. Remove equipment and devices when no longer required. Repair damage caused by installation. Remove post settings to a depth of 3 feet.

1.10 REMOVAL

A. Remove temporary materials, equipment, services, and construction prior to Substantial Completion inspection.

B. Clean and repair damage caused by installation or use of temporary facilities. Remove underground installations to a depth of 2 feet; grade site as indicated. Restore existing facilities used during construction to specified, or to original, condition.

END OF SECTION

SECTION 02075

ASPHALT AND PORTLAND CEMENT CONCRETE PAVEMENT DEMOLITION

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED.

A. Demolition and disposal of roadway pavements composed of Portland cement concrete, asphalt cement concrete or combination Portland cement concrete and asphalt concrete.

B. Pulverize of asphalt pavement and regrade.

1.02 MEASUREMENTS AND PAVEMENT

A. Measurement will be made based upon the estimated quantities in the proposal.

B. Pavement will be made based upon stated unit price, and actual quantities.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 PREPARATION

A. Review all the work procedures with ENGINEER.

B. Coordinate utility location by contracting Blue Stakes.

C. Preserve all active utilities which are to remain in service.

3.02 PORTLAND CEMENT CONCRETE PAVEMENT DEMOLITION

A. Prior to Portland cement concrete pavement removal, saw cut concrete full depth to near vertical straight lines.

3.03 ASPHALT CONCRETE PAVEMENT DEMOLITION

A. Saw cut to full depth and remove asphalt concrete pavement.

3.04 PROTECTION OF EXISTING SURFACES OUTSIDE OF THE WORK AREA

A. Do not damage adjacent concrete surfaces which are not scheduled for removal.

B. Use rubber cleats or pavement pads when operating backhoes, outriggers, track equipment, or any other equipment on or crossing paved surfaces.

C. Restore any paving outside the Work which is damaged by removal operations at no additional cost to the OWNER. Match the existing pavement structural section.

3.05 DISPOSAL OF WASTE MATERIALS

A. Portland cement concrete, asphalt concrete or combination shall be disposed at a suitable off-site location.

B. Disposal site shall meet applicable laws and ordinances.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 – GENERAL

1.01 SCOPE

This section specifies requirements for rough and finish grading, cut and fill operations, and excavation and backfill for structures, utilities and pipelines.

1.02 QUALITY ASSURANCE

A. Reference Standards

The publications referred to hereinafter form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. The latest edition of referenced publications in effect at the time of the bid shall govern, except where a specific date or edition is given below. In case of conflict between the requirements of this section and the listed standards, the requirements of this section shall prevail.

Reference	Title
ASTM C117	*Material Finer Than 75-Micrometer (No. 200) Sieve in Mineral Aggregates by Washing*
ASTM C136	*Sieve Analysis of Fine and Coarse Aggregate*s
ASTM D75	*Practices of Sampling Aggregates*
ASTM D1556	*Density of Soil in Place by the Sand-Cone Method*
ASTM D1557	*Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb. (4.54-kg) Rammer and 18-in. (457-mm) Drop*
ASTM D1682	*Breaking Load and Elongation of Textile Fabrics*
ASTM D2487	*Classification of Soils for Engineering Purposes*
ASTM D2922	*Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)*
ASTM D3017	*Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)*

ASTM D3787	*Bursting Strength of Knitted Goods; Constant Rate of-Traverse (CRT), Ball Burst Test*
ASTM D4318	*Liquid Limit, Plastic Limit, and Plasticity Index of Soils*
Caltrans	*Standard Specifications, State of California Business and Transportation Agency, Department of Transportation, Latest Edition (English units)*

State Standard Specifications: Whenever this specification is referenced, the following is understood.

1. All references to statistical testing are deleted.

2. Whenever a discrepancy occurs between the Standard Specifications and this specification, it is understood that this specification governs.

3. All references to measurement and payment are deleted.

B. Tests

The Construction Manager or a representative of the Construction Manager, will take samples and perform moisture content, gradation, compaction, and density tests during placement of fill and backfill materials to check compliance with these specifications. The Contractor shall remove surface material at locations designated by the Construction Manager and provide such assistance as necessary for sampling and testing. The Construction Manager may direct the Contractor to construct inspection trenches in compacted or consolidated fill and backfill to determine that the Contractor has complied with these specifications.

Tests will be made by the Construction Manager in accordance with the following:

Test	Standard Procedure
Moisture content	ASTM D3017
Density in-place	ASTM D1556 or ASTM D2922
Moisture-density relationships	ASTM D1557
Gradation	ASTM C136
Plasticity	ASTM D4318
Organic Content	ASTM D1557

The Contractor may, at his discretion take additional samples of insitu fill and backfill to monitor his progress. Sampling and testing performed by the Contractor shall be done at the Contractor's sole expense.

Tests will be conducted as the work progresses.

C. Final Acceptance of Fill and Backfill

Final acceptance of fill and backfill will be based on tests made on samples of material taken from the completed and compacted course. All testing for final acceptance shall be performed by the Construction Manager.

D. Rejection of Fill and Backfill

If tests conducted by the Contractor or the Construction Manager indicate that the material does not meet specification requirements, material placement will be terminated until corrective measures are taken. Material which does not conform to the specification requirements and is placed in the work shall be removed and replaced at the Contractor's sole expense.

1.03 DEFINITIONS

A. Backfill:
Material used in refilling a cut, trench or other excavation.

B. Bedrock:
Bedrock consists of solid geologic formations underlying unconsolidated surface materials.

C. Compaction:
The process of mechanically stabilizing a material by increasing its density at a controlled moisture condition. "Degree of Compaction" is expressed as a percentage of the maximum density obtained by the test procedure described in ASTM D1557 for general soil types abbreviated in this specification, for example as "XX% ASTM D1557 maximum density" or "XX% compaction."

D. Colluvium:
Unconsolidated surficial soils overlying bedrock.

E. Competent Material:
Competent material shall be defined as material that is suitable for supporting the intended loads. Determination of competent material will be done by a representative of the Construction Manager employed by the Construction Manager to inspect construction. Factors in determining competent material include the degree of fracturing, hardness, bearing capacity, and any other factors that affect the suitability of the soil.

F. Excavation:
The removal of soil to obtain a specified depth or elevation.

G. Fill, Engineered Fill or Embankment:

Specified material placed at a specified degree of compaction and moisture content to obtain an indicated grade or elevation.

H. Structural Foundation Fill:

Material used in refilling the area below the structural foundation and the base of the excavation.

I. Structural Backfill:

Material used in refilling a cut or other excavation between undisturbed sides of the excavation and below grade walls.

J. Lift:

Layer (or course) of soil placed on top of a previously prepared or placed soil in a fill or embankment.

K. Rock:

Rock is defined as material that cannot be ripped with a Caterpillar tractor (D-9) and single ripper.

Where trenching is necessary, and a Caterpillar tractor ripper cannot reach into the excavation, rock shall be defined as material that cannot be excavated with a track mounted 235 Caterpillar backhoe with narrow bucket and teeth.

The Construction Manager shall make the determination as to whether material is classified as rock.

L. Subgrade:

The uppermost layer of material (sometimes in situ soil or rock) graded or otherwise prepared for supporting the addition of base material, fill material, or structural foundation materials.

M. Unsuitable Material:

Existing in-place soil, unstable material, substandard fill or backfill material, or other material designated by the Construction Manager as having insufficient strength characteristics or stability to carry intended loads in fill or embankment without excessive consolidation or loss of stability. As a minimum, materials classified as PT, OH, or OL by ASTI D2487 are unsuitable. Also, material containing refuse, large rocks, debris, and other material which could cause backfill not to compact shall be considered unsuitable.

N. Unyielding Material:

Rock, rib, ridge, rock protrusion, or solid with cobbles in the trench bottom requiring a covering of finer grain material or special bedding to avoid bridging in the pipe or conduit.

O. Optimum Moisture Content:

Optimum moisture content shall be determined in accordance with ASTM D1557. Field moisture content shall be determined on the basis of the fraction of material passing the 3/4 in. sieve.

1.04 SUBMITTALS

Submittals shall be made in accordance with Section 01300, SUBMITTALS for the following:

1. Test results, certifications, and source for all imported earthwork materials (engineered fill, drain rock, crushed rock, etc.). See requirements below.

2. A copy of this specification section, with addendum updates, and all referenced sections, with addendum updates, with each paragraph, check marked to show specification compliance or marked to show deviation.

   All imported materials specified in this section are subject to the following requirements:

   All tests necessary for the Contractor to locate an acceptable source of imported material shall be made by the Contractor. Certification that the material conforms to the specification requirements, along with copies of the test results from a qualified commercial testing laboratory, shall be submitted to the Construction Manager for approval at least 30 days before material is required for use.

   All material samples required for material certification shall be furnished by the Contractor at the Contractor's expense. Samples shall be representative and be clearly marked to show the source of the material and the intended use on the project. Sampling of the material source shall be done by the Contractor in accordance with ASTM D75. Notify the Construction Manager at least 24 hours prior to sampling. The Construction Manager may, at his option, observe the sampling procedures. Tentative acceptance of the material source shall be based on an inspection of the source by the Construction Manager and/or the certified test results submitted by the Contractor to the Construction Manager at his discretion. No imported materials shall be delivered to the site until the proposed source and materials tests have been tentatively accepted in writing by the Construction Manager. Final acceptance will be based on tests made on samples of material taken from the completed and compacted course. All testing for final acceptance shall be performed by the Construction Manager.

   Gradation tests by the Contractor shall be made on samples taken at the place of production prior to shipment. Samples of the finished product for gradation testing shall be taken from each 1,500 tons of prepared materials or more often as determined by the Construction Manager, if variation in

gradation is occurring, or if the material appears to depart from the specifications. Test results shall be forwarded to the Construction Manager within 48 hours after sampling.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Type 1 Engineered Fill

Select excavated native, import or borrow material free from roots, organic matter, trash, debris, rocks larger than 3", and other deleterious materials and meeting the following minimum requirements:

Liquid Limit	<30
Plasticity Index	<8
Percent Passing 3" Sieve	100%
Percent Passing No. 200 Sieve	15-40%
Organic Content (By Weight)	0%

B. Type 2 Engineered Fill

In no case shall Type 2 engineered fill be used to support structures, slabs, or paved surfaces.

Type 2 engineered fill shall be native, import, or borrow material free from roots, organic material, trash, debris, rocks larger than 6 in., and other deleterious materials. The material shall contain sufficient fines to ensure that voids will be filled and that specified compaction requirements will be met.

C. Sand

Natural sand or sand produced from crushed gravel or crushed rock, maximum size ¼ inch, 95% shall pass a No. 4 sieve, free from clay and organic material, with a maximum of 8% passing the No. 200 sieve.

D. Drain Rock

Natural gravel, crushed gravel, or crushed rock, free from dirt, clay balls, roots, and organic material and conforming to Section 68 of the *Standard Specifications, Class 2* and the following washed sieve gradation as determined by ASTM C117 AND ASTM C136.

Sieve Size	Percent Passing by Weight
1 in.	100 %
3/4 in.	90 - 100
3/8 in.	40 - 100
No. 4	25 - 40
No. 8	18 - 33
No. 30	5 - 15
No. 50	0 - 7
No. 200	0 - 3

E. Crushed Rock

Crushed rock shall conform to the following gradation:

Sieve Size	Percent Passing by Weight
1 1/2 in.	87 - 100 %
3/4 in.	45 - 90
No. 4	20 - 50
No. 30	6 - 29
No. 200	0 - 12

Crushed rock material shall be composed of hard, durable, sound pieces having a specific gravity of not less than 2.60.

PART 3 - EXECUTION

3.01 GENERAL

A. Control of Water

The Contractor shall keep excavations free from water during construction. The static water level shall be drawn down a minimum of 2 ft below the bottom of excavations to maintain the undisturbed state of natural soils and allow the placement of any fill to the specified density. Disposal of water shall not damage property or create a public nuisance. The Contractor shall have on hand pumping equipment and machinery in good working condition for emergencies and shall have workers available for its operation. Dewatering systems shall operate continuously until backfill has been completed to 1 ft above the normal static groundwater level. The location of the Contractor's dewatering discharge shall be approved by the Construction Manager.

Groundwater shall be controlled to prevent softening of the bottom of excavations, or formation of "quick" conditions. Dewatering systems shall not remove natural soils.

Release of groundwater to its static level shall be controlled to prevent disturbance of the natural foundation soils or compacted fill and to prevent flotation or

movement of structures of pipelines.

Additional dewatering requirements are specified in Section 02140, DEWATERING.

Dewatering piping which crosses existing roads shall be buried or be able to be driven over by vehicles without causing damage to either vehicle or pipe. Contractor assumes all responsibility for any damage caused by dewatering pipe crossing roads.

Contractor shall be responsible for constructing and maintaining a temporary desilting basin to allow the water removed from trenches to pass through prior to discharge.

B. Shoring and Sheeting

Shore and sheet excavations over 5 ft in depth in accordance with Section 02160, EXCAVATION SUPPORT SYSTEMS.

C. Hauling

When hauling is done over highways or city streets, the loads shall be trimmed and the vehicle shelf areas shall be cleaned after each loading. The loads shall be watered after trimming to eliminate dust. All streets shall be swept clean daily where dirt and debris result from the Contractor's operation.

D. Maintenance of Roadways

All earthwork operations shall be performed in a manner which does not disrupt the continuous flow of traffic on existing roadways without prior approval of the Construction Manager.

E. Control of Erosion

The Contractor shall maintain earthwork surfaces true and smooth and protected from erosion. Where erosion occurs, the Contractor shall provide fill or shall excavate as necessary to return earthwork surfaces to the grade and finish specified.

F. Surplus Material

Surplus excavated material shall become the property of the Contractor and shall be disposed of at the Contractor’s expense.

Material shall not be stockpiled to a depth greater than 5 feet above the finished grade within 25 feet of any excavation or structure. The contractor shall maintain stability of all stockpiled materials.

The Contractor shall satisfy himself that there is sufficient material available for the

completion of the work before disposing of any material inside or outside the site. Shortage of material, caused by premature disposal of any material by the Contractor, shall be replaced by the Contractor at his expense.

G. Pavement, Curb, and Sidewalk Removal

Cut all bituminous and concrete pavements, regardless of the thickness, and all curbs and sidewalks, prior to excavation of the trenches with an approved pavement saw. Hydrohammers will be prohibited. Pavement shall be sawed completely through on neat lines parallel and equidistant from the trench centerline. Sawscuts shall be a minimum of 12 in. wider on each side of the actual trench width for asphalt concrete pavements and a minimum of 6 inches wider than the trench width for concrete pavements. Pavement and concrete materials removed shall be hauled from the site and disposed of as specified in Section 02100, SITE PREPARATION.

H. Excavation of Rock

If rock is encountered, notify the Construction Manager immediately. The Construction Manager will determine if the material meets the definition of rock as specified herein. The Construction Manager will then instruct the Contractor to relocate portions of the work to avoid the rock or will instruct the Contractor to excavate the rock. Blasting shall only be conducted following written approval of the Construction Manager.

I. Hazardous Waste

Contractor shall promptly notify the Construction Manager in writing, of any subsurface material that Contractor believes is hazardous, as defined in Section 25117 of the Health and Safety Code.

Upon discovery, material is to remain undisturbed until an investigation can be made by the Construction Manager.

3.02 EXCAVATION AND FILL—GENERAL EARTHWORK

A. Excavation

Excavation shall be to the elevations and dimensions indicated. Notify the Construction Manager immediately in writing in the event that it becomes necessary to remove hard, soft, weak, or wet material to a depth greater than indicated.

Soil disturbed or weakened by the Contractor's operations and soils permitted to soften from exposure to weather shall be excavated to firm foundation and refilled with engineered fill material compacted to 90% of ASTM D1557, Method D, maximum density. All work of this nature will be at the Contractor's expense.

B. Overexcavation

Where the undisturbed condition of existing soils is inadequate for support of the planned construction, the Construction Manager will direct the Contractor to overexcavate to adequate supporting soils. The excavated space shall be filled to the specified elevation with engineered fill compacted as specified in Subsection 3.05, Compaction. The quantity and placement of such material will be paid for as extra work in accordance with Section 00700, GENERAL CONDITIONS.

C. Filling Operations

1. Subgrade for Engineered Fill

All areas to receive engineered fill shall be prepared as specified herein.

For subgrades composed of undisturbed bedrock which is also classified as competent material, the subgrade shall be left undisturbed.

For subgrades not composed of competent bedrock the surface to receive engineered fill shall be scarified to a depth of 12 in., moisture conditioned, and compacted as specified in Section 3.05.

2. Proof-Rolling

Unless otherwise directed in writing by the Construction Manager proof-roll all subgrade surfaces, except undisturbed bedrock, prior to constructing engineered fill. Use a half loaded dump truck or similar heavy-wheeled vehicle acceptable to the Construction Manager to detect soft or loose zones. Notify the Construction Manager prior to commencement of proof-rolling. If soft or loose zones are found, excavate the soft or loose material to a depth directed by the Construction Manager, then fill and compact as specified for engineered fill. The quantity and placement of such material will be paid for as extra work.

3. Construction of Engineered Fill

Construct engineered fill to lines and cross sections shown. Deposit fill material in lifts not exceeding 8 inches in loose depth, moisture condition, and compact as specified in Section 3.05.

No fill shall be placed during weather conditions which will alter the moisture content of the fill materials sufficiently to make adequate compaction impossible. After placing operations have been stopped because of adverse weather conditions, no additional fill material shall be placed until the last layer compacted has been checked and found to be compacted to the specified densities.

Care should be taken during fill placement to prevent and/or correct any unstable or "pumping" subgrade conditions. Such conditions could develop with a combination of factors, including overly moist soils, heavy construction, equipment or frequent movement of equipment. If an unstable or "pumping" condition should

develop as determined by the Construction Manager, the affected soils shall be removed and replaced or aerated and allowed to stabilize prior to further work in the area. Furthermore, when, in the judgment of the Construction Manager, sufficient compaction effort has not been used or where the field density tests indicate that the required compaction or moisture content has not been obtained, the fill shall be reworked and recompacted as needed to obtain a stable fill at the required density and moisture content prior to placing additional fill materials.

The Contractor shall be responsible for the maintenance and protection of all embankments and fills made during the contract period and shall bear the expense of replacing any portion which has been displaced due to carelessness, negligent work, erosion or failure to take proper precautions.

3.03 EXCAVATION AND BACKFILL – PIPELINES AND UTILITIES

A. Excavation

1. General

Pipelines and utilities shall be installed in trenches. Excavation shall include the satisfactory loosening, removing, loading, stockpiling, transporting, and placement in final location (including disposal) of all materials necessary to for construction of trenches. Trench excavation shall include the removal of all materials and/or obstructions of any nature.

2. Trenching

Minimum trench width for piping shall be the outside diameter of the piping plus 18 inches. For duct banks the minimum width shall be three inches wider than the outside edges of the conduit bank. Maximum trench widths at the top of the pipe shall be as shown on the Drawings for the designated type bedding. For drainage pipe, if no maximum is shown, the Contractor shall limit top trench widths to pipe outside diameter plus 24 inches for pipe 24 inches or smaller, and pipe outside diameter plus 36 inches for pipe 27 inches and larger, except upon written approval of a wider trench by the Construction Manager.

If, because of soil conditions, safety requirements or other reasons, the trench width at top of pipe is increased beyond the width specified in the preceding paragraphs, laying conditions shall be upgraded or stronger pipe installed, designed in conformance with the specifications for the increased trench width, without additional cost to the Owner.

3. Manholes, Valves and Appurtenances

Excavation for manholes, valves, or other accessories shall be sufficient to leave at least 12 inches in the clear between their outer surfaces and the trench side, trench shield or shoring. Backfill under manholes, vaults,

tanks, or valves shall be imported material as designated on the drawings. Any unauthorized excess excavation below the elevation indicated for foundation of any structure shall be filled with sand, base material, or concrete, at the direction of the Construction Manager, and at the expense of the Contractor. Backfilling of manhole excavation shall conform to the backfilling required for trenches.

4. Location of Excavated Materials

During trench excavation, place the excavated material only within the approved working area. Do not obstruct any roadways or streets unless specified otherwise. Conform to all Federal, State, and local codes governing the safe loading of all trenches with excavated material.

Material shall not be stockpiled greater than 5 feet above grade within 25 feet of any excavation.

5. Overexcavation

Where the undisturbed condition of natural soils is inadequate for support of the planned construction, the Construction Manager will direct the Contractor to overexcavate to adequate supporting soils. The excavated space shall be filled to the specified elevation with bedding. The quantity and placement of such material will be paid for as follows:

i. Overexcavation and refilling up to 12 inches below the specified trench bottom elevation shall be solely the Contractor's responsibility and expense.

ii. Overexcavation and refilling in excess of 12 inches below the specified trench bottom elevation will be considered extra work in accordance with Section 00700, GENERAL CONDITIONS.

B. Backfill

1. General

Construct backfill as indicated and specified in this section. Place backfill in 8 in. maximum loose lifts unless otherwise specified. Bring up evenly on each side and along the full length of the pipe. Ensure that no damage is done to structures, pipe or their protective coatings. Compact each loose lift as specified in Subsection 3.05, Compaction, before placing the next lift. Do not backfill in freezing weather or where the material in the trench is already frozen or is muddy, except as authorized.

Where settlements occur in trenches due to improper compaction, the Contractor shall excavate to the depth necessary to rectify the problem, then backfill, compact as specified herein, and restore the surface to the required elevation. If pavement is damaged, it shall be removed after

carefully sawcutting the damaged area, and replaced as originally specified. All costs of repairing settlement and related damage shall be borne by the Contractor.

2. Bedding and Initial Backfill

The pipe shall be placed on a bed of imported materials. All loose material shall be removed from the trench bottom before placing the bedding material. Bedding shall extend at least 4 inches below the pipe barrel (6 inches for a pipe greater than 6 inches in diameter) and 1-1/2 inches below the pipe joint bell. No wedging or blocking of the pipe will be permitted. The pipe shall be bedded uniformly throughout its length. The bearing shall be achieved by shaping the bedding or by lightly "bouncing" the pipe to set it into the bedding.

The Contractor shall then place initial backfill material. Each lift shall be worked under the haunches of the pipe and thoroughly compacted to the specified compaction by shovel slicing, tamping and other appropriate means to achieve a dense and thoroughly compacted material that provides proper support under the pipe haunches. Care shall be used not to disturb or displace the pipe. Initial backfill shall be the material placed from the top of the bedding to a point 12 inches above the top of the pipe and pipe bell. Initial backfill shall be carefully placed evenly on both sides of the pipe so as not to disturb or damage the pipe, and compacted to the specified compaction. Jetting will not be allowed.

3. Subsequent Backfill

Subsequent trench backfill above the initial backfill shall be placed and compacted as specified. Jetting will not be allowed. However, until the total backfill above the top of the pipe exceeds 3 feet, machine-placed backfill material shall not be allowed to "free-fall" more than 2 feet. If the excavation is through an area used for horticulture, lawns or other cultivated areas, the final 12 inches of backfill shall be essentially the original topsoil which shall have been removed and stockpiled separately.

4. Finish Grading

Finished surfaces shall be smooth, compacted and free from irregularities. The degree of finish shall be that normally obtainable with a blade-grader.

Finished grade shall be as specified by the contours plus or minus 0.10 feet except where a local change in elevation is required to match sidewalks, curbs, manholes and catch basins, or to ensure proper drainage. Allowance for topsoil and grass cover, and subbase and pavement thickness shall be made.

5. Buried Warning and Identification Tape

Install tape specified in Section 15060, PIPING SYSTEMS, above all buried pipes and conduits in accordance with manufacturer's recommendations except as modified herein. Bury tape 12 inches below finished grade; under pavements and slabs, bury tape 6 inches below top of subgrade.

6. Open Trench

The Contractor shall not leave trenches open during hours when the Contractor is not actively working. All trenches shall be backfilled at the end of the day or up to 200 feet may be left shored and plated.

3.04 EXCAVATION AND BACKFILL -- STRUCTURES

A. General

The bottom excavation elevation shall be sufficient to allow the proper placing of forms and concrete construction to the elevations indicated, as specified herein.

B. Overexcavation

Under all structures, after excavation is complete to conduct the work shown on the plans, the Contractor shall scarify the top 12 in. and recompact the subgrade in accordance with Subsection 3.05, Compaction. The excavation shall be inspected by the Construction Manager. Where the existing soil is inadequate for supporting the planned structure, the Construction Manager will direct the Contractor to overexcavate to adequate supporting soils. The excavated space shall be filled as specified for Type I Engineered Fill. The quantity and placement of such material will be paid for as extra work in accordance with Section 00700, GENERAL CONDITIONS.

C. Foundation Inspection

Whenever any structure excavation is substantially completed to grade, the Contractor shall notify the Construction Manager who will make an inspection of the foundation for uniformity and suitability as a structure foundation. No concrete or masonry shall be placed until the foundation has been inspected by the Construction Manager. The Contractor shall, if directed by the Construction Manager, dig test pits and make test borings and foundation bearing tests. If the material tested complies with the specifications, the cost thereof will be paid for as extra work in accordance with Section 00700, GENERAL CONDITIONS. If the material tested does not comply with the specifications, the cost thereof (initial testing, remedial work, re-testing) will be borne by the Contractor.

D. Backfilling and Filling

1. Structural Backfill

Unless otherwise specified, structural backfill shall be Type I Engineered

Fill.

After completion of construction below the elevation of the final grade, and prior to backfilling, forms shall be removed and the excavation shall be cleaned of debris.

Structure backfill shall not be placed until the subgrade portions of the structure have been inspected by the Construction Manager. No backfill material shall be deposited against concrete structures until the concrete has developed the specified 28 day compression strength, and until the concrete has been in place for 14 days, whichever occurs later. Backfill material shall be placed in uniform layers (8 in. thick) and shall be brought up uniformly on all sides of the structure. Each lift shall be compacted in accordance with Subsection 3.05, Compaction.

2. Structural Foundation Fill

Where fill materials form the foundation for a structure, materials shall be Crushed Rock, Drain Rock, Rock Capillary Break, or Type I Engineered Fill as shown on the plans. Materials shall be placed in 8 in. lifts and compacted in accordance with Subsection 3.05, Compaction.

3.05 COMPACTION

Compact each layer or lift of material specified so that the in-place density tested is not less than the percentage of maximum density identified herein per ASTM D1557. Compaction shall be accomplished by mechanical equipment such as tamping rollers, sheepsfoot rollers, pneumatic tire rollers, vibrating rollers, or other mechanized tampers suitable for the work. Compaction of materials by ponding and jetting is prohibited.

Compaction methods and equipment used are subject to approval by the Construction Manager.

Material	Compaction % of ASTM D1557 Maximum Density	Moisture Content
Subgrade for Fill		
Subgrade for Structures		
Type 1 Engineered Fill	95%	
Type 2 Engineered Fill		
Bedding	85%	
Initial Backfill	85%	

Material	Compaction % of ASTM D1557 Maximum Density	Moisture Content
Subsequent Backfill – Not Below Pavement	90%	
Subsequent Backfill – Below Pavement	95%	
Structural Foundation Fill	95%	
Structural Backfill	95%	

3.06 FINISH GRADING

Finished surfaces shall be smooth, compacted and free from irregularities.
Finished grade shall be to the line and grade shown on the plans with allowance for topsoil and grass cover, and subbase and pavement thickness so that the specified thickness can be applied to attain the finished grade. Finished grade shall be within a tolerance of plus or minus 0.10 ft.

END OF SECTION

SECTION 02220

EXCAVATING, BACKFILLING AND COMPACTION

PART 1 GENERAL

1.01 WORK INCLUDED

A. Contractor shall provide all materials, labor, equipment, transportation and other items required to perform excavation, backfilling and compaction Work as indicated or as required to accomplish Work of other sections of these specifications. All excavation, backfilling and compaction Work shall be in accordance with applicable regulations and as specified herein.

B. Excavating, backfilling and compaction includes, but is not limited to the following:

1. Preparation

2. Excavation, backfilling and compaction

3. Dewatering and/or runoff control measures

4. Trench shoring

5. Clean up, protection, maintenance

1.02 RELATED WORK

A. Section 01005 - Administrative Provisions

1. Warranty requirements.

B. Section 02230 - Base Course

C. Section 02590 - Restoration of Existing Improvements

1. Restoration of surfaces or facilities lost, damaged or displaced as a result of Work included in this section.

D. Section 02720 - Storm Sewer Systems

1. Trench excavation, bedding, backfill and compaction requirements.

1.03 REFERENCES

A. The applicable provisions of the latest editions of the References listed below shall govern the Work covered under this Section, unless there is a conflict between said References and the requirements of this Section. In the case of such a conflict, the requirements of this Section shall apply.

B. Utah Occupational Safety and Health Division (UOSHD).

C. American Association of State Highway and Transportation Officials (AASHTO):

D. American Society for Testing and Materials (ASTM)

E. Midvale City Standard Construction Details

1.04 SUBMITTALS

A. Submit evidence of materials conformance with applicable requirements as well as these specifications.

B. Submit samples and laboratory test data of imported soil materials.

C. Submit product data for separation fabric.

1.05 QUALITY ASSURANCE

A. Comply with federal, state, and local codes and regulations.

B. All working conditions shall be in accordance with the "Utah Occupational Safety and Health Division," *Safe Practices for Excavation & Trenching Operations,* latest edition, or other Laws or Regulations which apply.

C. Salt Lake County requirements shall govern for all work in Salt Lake County road right-of-ways:

1. All work shall conform to the applicable standards, regulations, and requirements of the Salt Lake County Public Works Department.

2. Permits shall be obtained and paid for by the Contractor.

3. License and Permit Bond, without cancellation clause, in an amount and form prescribed

by the Salt Lake County Department of Public Works, shall be provided by the Contractor in connection with his excavations in Salt Lake County Right-of-Way.

D. Utah Department of Transportation requirements shall govern for all work in Utah Department of Transportation highway right-of-ways:

1. All work shall conform to the applicable standards, regulations and requirements of the Utah Department of Transportation, including the Specifications for Excavation on State Highways.

2. Permits shall be obtained and paid for by the Contractor.

3. License and Permit Bond, without cancellation clause, in an amount and form prescribed by the Utah Department of Transportation, shall be provided by the Contractor in connection with his excavations on Utah Department of Transportation Right-of-Way.

E. Utah Department of Transportation requirements in Salt Lake County Roads:

1. Where reference is made to Utah Department of Transportation standards in these Specifications for work in Salt Lake County roads, the work shall conform to the applicable Utah Department of Transportation standards.

F. Extended Warranty Period for work in Salt Lake County and Utah Department of Transportation roadways,
shall apply.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Materials suppliers shall provide, upon request, verification of a consistent record of meeting or exceeding materials or performance standards as specified herein.

2.02 FOUNDATION MATERIALS

A. All foundation materials shall be free from alkali, salt, and petroleum products, roots, sod, limbs, and other vegetative matter, slag, cinders, ashes and rubbish, or other material that in the opinion of the Engineer may be objectional or deleterious.

B. Undisturbed soil foundation material:

1. Shall be natural trench bottom soil unless unable to adequately support pipe or structures.

2. Shall not be lumpy or frozen.

C. Gravel:

1. Shall be hard, durable, broken stone or slag.

2. Shall be graded within the following limits:

Sieve	%Passing
1”	100
¾”	85-100
½”	20-40
No. 4	10-20

2.03 BEDDING MATERIALS

A. Sand Bedding Material:

1. Shall be free from alkali, salt, and petroleum products, roots, sod, limbs, and other vegetative matter, slag, cinders, ashes and rubbish, or other material that in the opinion of the Engineer may be objectional or deleterious.

2. Graded within the following limits:

Sieve	% Passing
3/411	100
No. 4	80-100
No. 10	30-50
No. 40	10-30
No. 200	0-15

2.04 BACKFILL MATERIALS

A. Granular backfill:

1. Shall be readily compactable and shall be free from alkali, salt, and petroleum products, roots, sod, limbs, and other vegetative matter, slag, cinders, ashes and rubbish, or other material that in the opinion of the Engineer may be objectional or deleterious.

2. Graded within the following limits:

Sieve	% Passing
3 inch	100
No. 10	50 max.
No. 40	30 max.
No. 200	15 max.

3. May be select material from excavation if it will meet all requirements of granular backfill, including compaction requirements as specified for type of surface improvement above trench.

B. Excavated Soil Backfill Material:

1. Shall be free from alkali, salt, and petroleum products, roots, sod, limbs, and other vegetative matter, slag, cinders, ashes and rubbish, or other material that in the opinion of the Engineer may be objectional or deleterious.

2. Shall be select material from excavation, with no particle larger than 4 inches in diameter.

3. Use on-site materials only if specified compaction requirements can be met.

2.05 STRUCTURAL FILL

A. Structural Fill

1. Naturally or artificially graded mixture of natural or crushed gravel, and natural or crushed sand;

   ASTM D 2940; well graded, with at least 90 percent passing a 11/2 -inch (38mm) sieve and not more than 17 percent passing a No. 200 (0.075mm) sieve.

2.06 SUBGRADE STABILIZING MATERIAL

A. Use "Granular Backfill" as defined in "Backfill Materials" Section above.

2.07 DRAINAGE FILL

A. Drainage Fill: Washed, narrowly graded mixture of crushed or uncrushed gravel; ASTM D 448; with 100

percent passing a 11/2 -inch (38mm) sieve and 0 to 5 percent passing a No. 8 (2.36mm) sieve.

2.08 STABILIZING FABRIC

A. Separation Fabric: Non-woven geotextile, specifically manufactured for use as a separation stabilization geotextile; made from polypropylene, and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:

1. Grab Tensile Strength: 200 lbf; ASTM D 4632

2. Tear Strength: 75 lbf; ASTM D 4533

3. Puncture Resistance: 1101bf;ASTMD4833

4. Water Flow Rate: 40 gpm per sq. ft.; ASTM D 4491

5. Apparent Dopening Size: No. 40; ASTM D 4751

PART 3 EXECUTION

3.01 EXAMINATION

A. It shall be the Contractor's sole responsibility to locate all (whether or not shown on the Drawings) existing water, sanitary sewer, storm drain, and gas lines, electrical and telephone conduit and other underground utilities with their existing house service connections, and all other underground structures in order that no damage or loss of service will result from interference with existing lines.

B. Review all available drawings, notes, and information on the location of these underground lines and structures in determining the location of the existing facilities.

C. Have an electronic pipe finder on the job at all times and mark all lines on the road ahead of the excavating machine.

D. Blue Stakes Location Center shall be contacted 48 hours before any excavation is commenced. Phone 532-5000 for assistance.

E. Mark with paint any existing cracks on concrete along which work will take place, in order to determine after the construction is completed whether such damage was caused by the operations of the Contractor or had occurred previously. Any concrete showing unmarked cracks upon completion of construction shall be evidence of damage caused by the Contractor, and shall be replaced or repaired to

the satisfaction of the Owner of the damaged concrete, at the Contractor's sole expense.

F. All fences removed for excavation shall be returned to their original condition except that damaged portions will be replaced with new fencing at the Contractor's expense.

G. Obtain all required permits.

3.02 METHODS AND PROCEDURES

A. General Requirements

1. All gas, sanitary sewer, storm drain, water and other pipelines, flumes and ditches of metal, wood or concrete, underground electrical conduits and telephone cable, and all walks, curbs, and other improvements encountered in excavating trenches carefully shall be supported, maintained and protected from injury or interruption of service until backfill is complete and settlement has taken place.

2. If any existing facility is damaged or interrupted, promptly after becoming aware thereof and before performing any Work affected thereby, identify the owner of such existing facility, and give written notice thereof to that owner and the Owner and Engineer. Indemnify the Owner from any and all damages resulting from damaged facilities.

3. All damage, injury or loss resulting from lack of adequate sheeting, bracing, and shoring shall be the responsibility of the Contractor; and the Contractor shall effect all necessary repairs or reconstruction resulting from such damage.

4. The trenches shall not be backfilled until the utilities systems as installed conform to the requirements of the Drawings and Specifications. Where, in the opinion of the Engineer, damage is likely to result from withdrawing sheeting, the sheeting shall be left in place.

5. Trenches shall be backfilled to the proper surface with material as shown or specified. Trenches improperly backfilled shall be reopened to the depth required for correction, then refilled and compacted as specified, or the condition shall be otherwise corrected as approved.

6. Care shall be exercised so that when backfilling is complete and settlement has taken place, all existing pipes, flumes, ditches, conduits, cables, walks, curbs, and other improvements will be on the same alignment and grade as they were before work commenced.

7. Compaction shall be the responsibility of the Contractor. He shall select the methods to be used and carefully perform the work of backfilling and compaction so as to prevent damage to new or existing piping. Any new or existing piping damaged during the Contractor's work shall be replaced as directed by the Engineer with new piping.

3.03 INSTALLATION

A. Excavation

1. Excavation for pipe lines, concrete valve boxes, manholes and appurtenant structures shall include the work of removing all earth, sand, gravel, quicksand, stone, loose rock, solid rock, clay, shale, cement, hardpan, boulders, and all other materials necessary to be moved in excavating the trench for the pipe; maintaining the excavation by shoring, bracing, and sheeting or well pointing to prevent the sides of the trench from caving in while pipe laying is in progress; and removing sheeting from the trench after pipe has been laid.

2. Trench support system shall be suitable for the soil structure, depth of cut, water content of soil, weather conditions, superimposed loads, vibration. Contractor may select one of the following methods of ensuring the safety of workers in the trench, as approved by the Utah State Industrial Commission or its safety inspectors:

   a. Sloping sides of trench to the angle of repose at which the soil will remain safely at rest.

   b. Shoring trench sides by placing sheeting, timber shores, trench jacks, bracing, piles, or other materials to resist pressures surrounding the excavation.

   c. Using a movable trench box built-up of steel plates and a heavy steel frame of sufficient strength to resist the pressures surrounding the excavation.

3. Trenches shall be of the necessary width for proper laying of pipe. Care shall be taken not to over excavate. The bottom of the trenches shall be accurately graded to provide uniform bearing and support for each section of the pipe along the entire length of the barrel of the pipe.

4. Trenches shall be excavated to the depths shown on the Drawings, including any required allowances for the sewer rock foundation, when required, and for other pipe bedding requirements.

5. Minimum cover over the top of the pipe, including any paving, shall be as follows:

    a. Water supply piping: 3.5 feet minimum from finish grade.

6. Grading of trenches shall be performed to avoid interference of water and sewer lines with other underground utilities and structures:

    a. Water supply piping: Unless otherwise indicated, trenches shall be graded to avoid high points with the necessity of placing vacuum and relief valves in the water lines.

7. The width of trench, measured at the top of the pipe, shall be as narrow as possible but not wider than 15 inches on each side of sewer or water pipe.

8. Excavation for manholes, concrete valve boxes, and similar structures shall be sufficient to leave at least 12 inches in the clear between the outer surfaces and the embankment or timber that may be used to hold and protect the banks.

9. Excess materials shall be hauled away from the construction site or otherwise disposed of by the Contractor as approved by the Engineer.

B. Backfilling

1. Materials for trench backfill shall be as shown on the Drawings.

2. Pipe bedding:

    a. Consists of preparing an acceptable pipe foundation, excavating the pipe groove in the prepared foundation and backfilling from the foundation to 12 inches above the top of the pipe. All piping shall be protected from lateral displacement and possible damage resulting from impact or unbalanced loading during backfilling operations by being adequately bedded.

    b. Pipe foundation: Shall consist of natural soil in the bottom of the trench, or a built up foundation if conditions so warrant. Wherever the trench subgrade material does not afford a sufficiently solid foundation to support the pipe and superimposed load, and where groundwater must be drained, the trench shall be excavated below the bottom of the pipe to such depth as may be necessary, and this additional excavation filled with clean, compacted sewer rock.

    c. A pipe groove shall be excavated in the pipe foundation to receive the bottom quadrant of the pipe so that the installed pipe will be true to line and grade. Bell holes shall be dug after the trench

bottom has been graded. Bell holes shall be excavated so that only the barrel of the pipe bears on the pipe foundation.

d. Pipe bedding from pipe foundation to 12 inches above top of pipe: Materials shall be deposited and compacted in layers not to exceed 8 inches in uncompacted depth. Deposition and compaction of bedding materials shall be done simultaneously and uniformly on both sides of the pipe. All bedding materials shall be placed in the trench with hand tools or other approved method in such a manner that they will be scattered alongside the pipe and not dropped into the trench in compact masses. Materials used shall be as shown in the Typical Trench Section in the Drawings and as specified in Part 2.

3. Each lift shall be evenly spread and moistened or dried by disk harrowing or other means so that the required density will be produced.

4. Backfill around valves with Granular Backfill Material.

5. Place drainage fill around and under sumps, as shown on drawings.

C. Compaction

1. Backfill Compaction Requirements:

a. Under pavements, or other surface improvements, the average density shall be 96% of laboratory maximum density with no individual test lower than 92% of the laboratory maximum density, as determined by AASHTO Designation T-1 80 (ASTM D-1 557).

b. In shoulders and other unimproved areas, the average density shall be 90% of laboratory maximum density with no individual test lower than 86% of the laboratory maximum density, as determined by AASHTO Designation T-1 80 (ASTM D-1 557).

2. Compaction shall be performed in strict accordance with the manufacturer's recommendations for each type of pipe.

3. Mechanical compaction: Shall be accomplished by the use of sheeps-foot rollers, pneumatic tire rollers, vibrating rollers, or other mechanical tampers of a size and type necessary to achieve the required degree of compaction.

D. Dewatering

1. The Contractor shall do all pumping, shall build all drains and do all the work necessary to keep the trench and pipes free from water during the progress of the work.

2. In wet trenches, a channel shall be kept open along the side of the pipe for conducting the water to a sump hole, from which it shall be pumped out of the trench. No water shall be allowed to enter the pipe.

E. Stabilizing Fabric

1. Install separation fabric on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.

3.04 PROTECTION

A. Provide barricades and restrict access as appropriate to prevent damage to Work in place.

B. Contractor shall be responsible for protection of Work in place against displacement, damage, or loss until Owner's acceptance. Any work and subsequently damaged, lost or displaced shall be repaired or replaced to the Owner's satisfaction at no additional cost.

3.05 CLEANING

A. Thoroughly clean, rake, wash, flush or sweep as required to clean adjacent improvements of materials covered as part of this Work prior to submitting for Owner's acceptance.

B. Contractor shall provide all labor, equipment, materials and other items as required to perform clean up as required by the Owner, adjacent property owners and other jurisdictions.

C. Finish grading of areas affected by this Work shall be required as part of clean up.

D. The roadway including shoulders, slopes, ditches, and borrow pits shall be smoothly trimmed, and shaped by machinery, or other satisfactory methods, to the lines, grades and cross-sections, as established, and shall be so maintained until accepted. Any surplus material not suitable for spreading along the road to widen the existing shoulder or raise the grade shall be disposed of as specified above.

3.06 TESTING

A. The Owner shall employ a testing laboratory to perform field and laboratory density tests, except that the Contractor shall make such additional tests, at his expense, as deemed necessary by him to assure that the work of compaction is performed properly, determine any adjustments in compacting equipment, thickness of layers, moisture content and compactive effort or other means necessary to obtain the specified minimum relative density. Provide access to the work and all men and machinery necessary to aid the testing laboratory personnel

in performing field density tests or taking samples for laboratory tests. In general, tests and samples shall be made as the work proceeds.

B. The Owner shall have testing laboratory perform maximum density tests on materials to be compacted from samples submitted by Contractor taken from locations selected by the Engineer.

C. The Owner shall have testing laboratory perform field density tests of compacted backfill materials. The approximate location and number of such tests shall be as shown on the drawings, as described in the Bid Form, or as selected by the Engineer. Field density tests shall be taken as follows:

1. In planted or unimproved areas:

    a. 18" above the top of the pipe

    b. Finished grade

2. In streets, roads, parking lots or other paved areas:

    a. 18" above the top of the pipe

    b. 24" to 36" below the gravel road base

    c. Gravel road base subgrade

    d. Top of gravel road base

    e. Top of bituminous surface course

D. Copies of test results prepared by the testing laboratory shall be transmitted to the Contractor at the same time they are transmitted to the Engineer.

E. Successful performance of compaction at the location of the field density test shall not relieve the Contractor of his responsibility to meet the specified density requirements for the complete project.

END OF SECTION

SECTION 02278

ROAD BASE - UNTREATED BASE COURSE

PART 1 GENERAL

1.01 DESCRIPTION

A. This work consists of the placement of Untreated Base Course material at designated road ways and all driving surfaces as indicated on the Drawings.

1.02 REFERENCES

A. The latest edition of the following publication forms a part of this specification to the extent referenced. The publication is referred to in the text by basic designation only.

AASHTO T 88-	Particle Size Analysis of Soils
AASHTO T 180-	Moisture-Density Relations of Soils Using a 10-lb. (4.54 kg) Rammer and an 18-in (457 mm) Drop
AASHTO T 191-	Density of Soil In-Place by the Sand-Cone Method
AASHTO T 205-	Density of Soil In-Place by the Rubber-Balloon Method
AASHTO T 238-	Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
AASHTO T 239-	Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 422-	Particle-Size Analysis of Soils
ASTM D 698-	Test Method of Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb. (2.5-kg) Rammer and 12-in. (305-mm) Drop
ASTM D 1556-	Density of Soil in Place by the Sand-Cone method
ASTM D 1557-	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54-kg) Rammer and 18-in. (457-mm) Drop
ASTM D 2487-	Classification of Soils for Engineering Purposes
ASTM D 2922-	Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017-	Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

B. The 1997 Edition of the State of Utah Standard Specification for Road and Bridge Construction as amended.

C. The 1997 Edition of the American Public Works Association (APWA) and Associated General Contractors of America Standard Plans and Standard Specifications.

1.03 SUBMITTALS

A. Untreated Base Course (APWA approved 3/4" Gradation).

1.04 MEASUREMENT AND PAYMENT

A. Road Base shall be measured or paid in accordance with Section 01025 - Measurement and Payment.

PART 2 PRODUCTS

2.01 MATERIALS

A. Untreated Base Course**:** Untreated Base Course Materials shall meet the APWA Specifications for 3/4" gradation.

APWA 3/4" UBC GRADATION	
SIEVE SIZE	**MASTER GRADING BAND LIMITS (PERCENT PASSING)**
3/4 inch	100
3/8 inch	78-92
No. 4	55-67
No. 16	28-38
No. 200	7-11

PART 3 EXECUTION

3.01 UNTREATED BASE COURSE MATERIAL PLACEMENT

A. No Untreated Base Course material shall be placed on Sub-Base materials until the Sub-Base has been checked and accepted by the ENGINEER.

B. Untreated base course material placed on driving surfaces shall be compacted to a minimum density of 90% in accordance with ASTM D-1557 to provide a uniform graded smooth surface.

C. Untreated Base Course material shall be placed to the minimum thicknesses shown on the drawings.

3.02 FIELD QUALITY CONTROL

A. CONTRACTOR shall be responsible for directing proper placement of all road base materials. CONTRACTOR shall be responsible for the stability of the road base materials during placement and shall replace any portions which have become displaced due to careless or negligent work on the part of CONTRACTOR, or to damage resulting from natural causes, such as storms.

B. Whenever the work areas to receive Untreated Base Course material are covered with snow, the snow must be removed prior to placing the Untreated Base Course, and deposited outside the immediate construction areas at the CONTRACTOR's expense.

C. The CONTRACTOR shall be responsible to maintain all provided and installed road base surfaces until such time as weather conditions allow for the installation of the hot-mix asphalt concrete paving.

END OF SECTION

SECTION 02510

ASPHALT CONCRETE PAVING

PART 1 - GENERAL

1.01 SCOPE

This section specifies the work necessary to furnish and install asphalt concrete pavement consisting of aggregate base, asphaltic concrete, liquid asphalt and associated materials where shown on the plans.

1.02 QUALITY ASSURANCE

A. Reference Standards

This section references the following documents. They are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Reference	Title
CALTRANS	*Standard Specifications*, State of California Business and Transportation Agency, Department of Transportation, 1988
ASTM D1557-78	*Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb (4.54 kg) Rammer and 18 Inch (457-mm) Drop*
Fed. Spec. TT-P-115E	*Paint, Traffic, Highway, White and Yellow*
PS20-70	*American Softwood Lumber Standard*

1. State Standard Specifications: Whenever this specification is referenced, the following is understood.

    a. All references to statistical testing are deleted.

    b. Whenever a discrepancy occurs between the *Standard Specifications* and this specification, it is understood that this specification governs.

    c. All references to measurement and payment are deleted.

B. Testing

Testing will be conducted by the Construction Manager to determine compliance with the specified degree of compaction and moisture content. Testing costs shall be paid for by the District.

1.03 SUBMITTALS

The Contractor shall submit information in accordance with Section 01300, SUBMITTALS, to substantiate compliance with this specification. Information submitted shall include at least the following: representative samples of acceptable materials proposed for use in the mix shall be furnished for testing, a manufacturer's certification for asphalt products and an asphalt concrete mix design by an independent, qualified laboratory.

PART 2 - PRODUCTS

2.01 ROAD PAVEMENT

A. Aggregates

The grading and proportioning of aggregates shall be such that the combined mineral aggregate conforms to the specified requirements.

1. Aggregates for base course shall conform to Section 26 of the *Standard Specifications,* Class 2, for 3/4 in. maximum size gradation.

2. Aggregate for asphaltic concrete shall conform to Section 39 of the *Standard Specifications,* Type B for individual test result conforming to 3/4 in. maximum size gradation, medium.

B. Asphaltic Materials

1. Asphalt Cement: Section 92 of the *Standard Specifications,* Grade AR-4000.

2. Liquid Asphalt: Section 93 of the *Standard Specifications,* SC-250.

3. Asphaltic Emulsion: Section 94 of the *Standard Specifications,* SS1 or SS1h.

C. Paint

Paint shall comply with Fed. Spec. TT-P-115, Type III, color as indicated.

PART 3 - EXECUTION

3.01 PROTECTION

Concrete walks, curbs and bases, and other improvements adjacent to the operations shall be protected. Contractor shall be responsible for damage caused by his employees or equipment and shall make necessary repairs. Building and other surfaces shall be covered with paper or other protection, where required.

3.02 BASE COURSE

A. Requirements

Place aggregate base in accordance with requirements of Section 26 of the *Standard Specifications* and to the thickness shown. Grade and compact to at least 95% of maximum density ASTM D1557 Method D. Where aggregate base course is not required, native or fill material shall be compacted as specified on the drawings and in accordance with Section 02200, EARTHWORK.

B. Maintenance

Maintain the base course until the asphaltic pavement is in place. Maintenance shall include drainage, rolling, shaping, and water as necessary to maintain the course in proper condition. Maintain sufficient moisture at the surface to prevent a dusty condition by light sprinkling with water.

C. Finish Surface

Surface tolerance shall comply with Section 26 of the *Standard Specifications*. The finish surface of base course, when tested for uniformity of slope, shall not deviate at any point more than 3/8 in. from bottom of a 10 ft straight edge laid in any direction. When base course is constructed in more than one layer, specified smoothness requirements shall apply to top surface.

D. Weed Control

One day before the application or placement of bituminous material on the subgrade, the surface shall be sterilized with herbicide. Apply chemical at the rate of 4 lbs/100 ft^2. Apply to the surface dry or as a solution. If applied dry, add water to the surface at a rate of 4 gal/100 ft^2. If applied as solution, dissolve chemical at the rate of 1 lb/gal of water and spray on at the rate of 4 gal of solution per 100 ft^2.

E. Prime Coat

Prior to the application of the asphaltic concrete, apply a bituminous prime coat of liquid asphalt on the prepared compacted base at the rate of 0.25 gal/yd^2 in accordance with Sections 39 and 93 of the *Standard Specifications*. Apply liquid asphalt by pressure distributors. Allow sufficient time before placing the asphalt concrete to permit the prime coat asphalt to penetrate the prepared compacted base.

F. Paint Binder

Apply asphaltic emulsion to the existing pavement surfaces in accordance with Sections 39 and 94 of the *Standard Specifications*.

3.03 ASPHALT CONCRETE

A. Requirements

The bituminous concrete shall consist of mineral aggregate, uniformly mixed with bituminous material in a central plant in accordance with Section 39 of the *Standard Specifications*. The mixing plant and construction equipment shall conform to the requirements of Section 39 of the *Standard Specifications*.

The percentage of asphalt cement binder in the road pavement shall be between 5 and 7%.

B. Placing

Deliver bituminous mixtures to the roadbed at temperatures specified in Section 39 of the *Standard Specifications*. Spread in accordance with Section 39 of the *Standard Specifications*. Cover all loads with tarpaulin or other material during transportation.

C. Compaction

Initial or breakdown rolling and the final rolling of the uppermost layer of the asphalt concrete shall be in accordance with Section 39 of the *Standard Specifications*. Compaction by vehicular traffic shall not be permitted.

D. Joining Pavement

Carefully make joints between old and new pavement or between successive days' work in such manner as to insure a continuous bond between old and new sections of the course. Expose and clean edges of existing pavement. Cut edge to straight, vertical surfaces. Paint all joints with a uniform coat of paint binder before the fresh mixture is placed. Prepare joints in the new pavement in accordance with Section 39 of the *Standard Specifications*.

E. Bond Coat

Provide a bond coat of bitumen between courses per *Standard Specifications*, Section 39, applied uniformly at a rate of 0.10 gal/yd^2.

F. Protection of Pavement

After final rolling, no vehicular traffic of any kind shall be permitted on the pavement until it has cooled and hardened and in no case less than six hours.

G. Drainage

Asphalt concrete placed within 3 ft of all structures shall be sloped a minimum of 2% to drain water away from structures unless otherwise shown on the drawings.

3.04 STRIPING PARKING AREA PAVEMENTS

A. General

All pavement striping and marking shall be given one coat of paint. Repaint existing markings damaged by construction.

B. Weather Limitations

Apply paint only when the pavement is dry. Paint shall not be applied when the atmospheric temperature is below 50°F nor under unfavorable wind conditions.

C. Preparation of Surface for Painting

Allow new pavement surfaces to cure for a period of 21 days before paint application. Immediately before applying the paint, the pavement surface shall be thoroughly cleaned of all dust, dirt, scale, water, oil, grease or other objectionable matter. Solvent material that will damage pavement shall not be used as cleaning agents. Clean all pavement surfaces immediately prior to painting with a power broom and a power blower using compressed air following the brooming.

D. Tolerances

Marking and striping shall be within 2 in. of the alignment as shown. Size of markings and strips shall be within 1/2 in. of the dimensions shown on the drawings.

E. Application

Immediately following the preparation of the pavement surface, the paint shall be applied with a traffic stripe painting machine. The paint shall be applied at the rate of 100-110 ft^2/gal of paint. The stripe painting machine shall have a compressor capacity of at least 105 ft^3 and be capable of operating at an air pressure of 125 psi.

F. Paint

The paint shall be mechanically agitated while the machine is in operation. The striping machine shall be equipped with a pointer so designed that the machine will hold exactly to the alignment. The propelling vehicle shall be equipped with a speedometer or tachometer, and with a suitable device for determining the quantity of paint in the container. Clean paint container and spray nozzles on the machine before starting each day's work. The stripe shall be of the required width, with clean true edges and without sharp breaks. Provide all warning devices required to protect the painting operations and the finished work. Repaint to the applicable specifications at Contractor's expense, any

portion of the stripe damaged by any type of traffic within 24 hrs after the stripe has been applied.

3.05 HEADERBOARDS

Boards shall be 2 in. x 6 in. secured in place using 2 in. x 4 in. x 24 in. minimum length stakes spaced not more than 6 ft apart. All forms shall be set to true alignment and grade. Headerboard and stakes shall be either redwood (rough sawn construction heart grade), Western red cedar or pressure treated Douglas Fir at the Contractor's option, conforming to U.S. Department of Commerce PS-20. Untreated headerboards shall be scored to prevent warping. Earth shall be placed against the outside shoulder of the forms and compacted sufficiently to prevent forms from spreading during the compaction of the pavements.

END OF SECTION

SECTION 02730

SANITARY SEWERS

PART 1 - GENERAL

1.01 SUMMARY

A. This project requires construction of a sewer pipeline under either private property, City, County or State roads.

1.02 RELATED WORK

A. Related work specified in other sections includes but is not limited to:

Section 01500 - Temporary Construction and Environmental Controls
Section 02221 - Excavation and Backfill for Buried Pipelines
Section 02278 - Road Base - Untreated Base Course
Section 02731 - Sewer Service Laterals
Section 15065 - Polyvinyl Chloride Pipe

1.03 MEASUREMENT AND PAYMENT

A. Measurement and Payment shall be as noted in Section 01150.

1.04 REFERENCES

A. The latest edition of the following publications form a part of this specification to the extent referenced. The publication is referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

A 48	Gray Iron Castings
A 536	Ductile Iron Castings
C 14	Concrete Sewer, Storm Drain, and Culvert Pipe
C 33	Concrete Aggregates
C 76	Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
C 94	Ready-Mixed Concrete
C 150	Portland Cement
C 260	Specification for Air-Entraining Admixtures for Concrete
C 443	Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
C 478	Precast Reinforced Concrete Manhole Sections
C 564	Rubber Gaskets for Cast Iron Soil Pipe and Fittings
C 924	Concrete Pipe Sewer Lines by Low-Pressure Air Test Method
D 3034	Type PSM Polyvinyl Chloride Sewer Pipe and Fittings
F 679	Polyvinyl Chloride Large Diameter Gravity Sewer Pipe and Fittings
F 1803	Polyvinyl Chloride Closed Profile Gravity Pipe and Fittings

FEDERAL SPECIFICATIONS (FS)

FS RR-F-621 Frames, Covers, Gratings, Steps, Sump and Catch Basin, Manhole

PART 2 - PRODUCTS

2.01 PIPE

A. All pipe diameters shown on the drawings and listed in the contract documents are nominal inside diameters unless otherwise noted. Pipe manufacturers shall provide evidence of ability to produce acceptable pipe by demonstrating five years production history. A list of clients, including name, address and phone number, for whom pipe has been installed may be required by the Engineer.

B. Pipe shall meet the requirements of Section 15065 - Polyvinyl Chloride Pipe.

C. Branch connections shall be made by use of regular fittings.

2.02 CEMENT MORTAR

A. Cement Mortar shall conform to ASTM C 270, Type M with Type II, IIA or V cement.

2.03 PIPE CONNECTIONS TO MANHOLES AND VAULTS

A. Acceptable connections between pipe and manholes and vaults are as follows (alternate methods must be approved by the ENGINEER):

1. KOR-N-SEAL System.

2.04 BEDDING AND BACKFILL

A. Pipe bedding and backfill shall be in accordance with the requirements of Section 02221 - Excavation and Backfill for Buried Pipes.

2.05 FRAMES AND COVERS

B. Frames and Covers shall be cast iron, ductile iron or reinforced concrete. Cast-iron frames and covers shall be as indicated in all essentials of design or to FS RR-F-621, type as suitable for the application, circular, with or without vent holes as shown on the drawings or directed by the ENGINEER. The frames and covers shall have a combined weight of not less than 400 pounds and shall conform to ASTM A 48, Class 20B. The word "Sewer" at least 2 inches high, shall be stamped or cast into all covers so as to be plainly visible. Reinforced concrete frames and covers shall be as indicated. Ductile iron for frames and covers shall conform to ASTM A 536.

2.04 PORTLAND CEMENT

A. Portland Cement shall conform to ASTM C 150, Type II, IIA or V for concrete used in concrete pipe, concrete pipe fittings, and manholes and type optional with the CONTRACTOR for cement used in concrete cradle, concrete encasement, and thrust blocking. Air-entraining admixture conforming to ASTM C 260 shall be used with Type II or V cement. Where aggregates are alkali reactive, as determined in accordance with Appendix XI of ASTM C 33, a cement containing less than 0.60 percent alkalies shall be used.

2.05 PORTLAND CEMENT CONCRETE

A. Portland Cement Concrete shall conform to ASTM C 94, compressive strength of 4000 psi at 28 days, except for concrete thrust blocking, for cradle and encasement, or for concrete blocks for manholes. Concrete used for thrust blocking and cradle and encasement shall have a compressive strength of 2500 psi minimum at 28 days. Concrete cast-in-place shall be protected from freezing and moisture loss for 7 days.

2.06 PRECAST REINFORCED CONCRETE MANHOLE AND VAULT SECTIONS

A. Precast Reinforced Concrete Manhole Sections shall conform to ASTM C 478, except that portland cement shall be as specified herein. Joints shall be cement mortar, or an approved mastic or rubber gasket, or an approved combination of these types. Manholes shall have a minimum of 12” road base compacted to 90% modified proctor.

2.07 MARKING AND TRACER TAPE

A. Marking and tracer tape shall be 2" minimum in width by 5.0 mil overall thickness, with no less than a 50 gauge solid aluminum foil core. It shall be Safety Green in color and have the word "SEWER" marked on it. It shall be as manufactured by Magnatec or equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Adjacent Facilities: Where the location of the sewer is not clearly defined by dimensions on the drawings, the sewer line (horizontally) shall be at least 10 feet away from a water-supply main or service line. However, when the bottom of the water pipe will be at least 18 inches above the top of the sewer pipe, the horizontal spacing may be a minimum of 6 feet. Where gravity-flow sewers cross above water lines, the sewer pipe for a distance of 10 feet on each side of the crossing shall be fully encased in concrete or shall be acceptable pressure pipe with no joint closer horizontally within 3 feet to the crossing. The thickness of the concrete encasement shall be at least 4 inches at the pipe joints.

B. Pipe Laying General:

Pipe shall be protected against impact shocks and free fall. The pipe interior shall be free of extraneous material.

Pipe laying shall proceed upgrade with the spigot ends of bell-and-spigot pipe and tongue ends of tongue-and-groove pipe pointing in the direction of the flow. Each pipe shall be laid accurately to the line and grade shown on the drawings. Pipe shall be laid and centered so that the sewer has a uniform invert. As the work progresses, the interior of the sewer shall be cleared of all superfluous materials.

Before making pipe joints all surfaces of the portions of the pipe to be joined shall be clean and dry. Lubricants, primers, and adhesives shall be used as recommended by the pipe manufacturer. The joints shall then be placed, fitted, joined, and adjusted so as to obtain the degree of water tightness required.

Pipes shall be installed per manufacturer direction and according to Section 02221 - Excavation and Backfill for Buried Pipelines.

C. Trenches shall be kept free of water and as dry as possible during bedding, laying, and jointing, as long as required. When work is not in progress, open ends of pipe and fittings shall be satisfactorily closed so that no trench water or other material will enter the pipe or fittings.

D. As soon as possible after the pipe joint is made, sufficient backfill material shall be placed along the pipe to prevent pipe movement off line or grade. Plastic pipe shall be completely covered to prevent damage from ultraviolet light.

E. Pipe Abandonment: Plug outlet pipes from existing manholes from which flows are diverted.

2.02 TESTING

A. All testing shall be the responsibility of the CONTRACTOR at no additional expense to the OWNER. The cost of testing shall be included in the cost for pipe installations.

B. Leakage Tests: Gravity Sewer Lines shall be tested for leakage by low pressure air testing, infiltration tests or exfiltration tests, as appropriate. Low pressure air testing for concrete pipes shall be as prescribed in ASTM C 828. Low pressure air testing procedures for other pipe materials shall use the pressures and testing times prescribed in ASTM C 828 and ASTM C 924, after consultation with the pipe manufacturer. Prior to infiltration or exfiltration tests, the trench shall be backfilled up to at least the lower half of the pipe. If required, sufficient additional backfill shall be placed to prevent pipe movement during testing, leaving the joints uncovered to permitted inspection. Visible leaks encountered shall be corrected regardless of leakage test results. When the water table is 2 feet or more above the top of the pipe at the upper end of the pipeline section to be tested, infiltration shall be measured using a suitable weir or other device acceptable to the Engineer. When the Engineer determines that infiltration cannot be properly tested, an exfiltration test shall be made by filling the line to be tested with water so that a head of at least 2 feet is provided above both the water table and the top of the pipe at the upper end of the pipeline to be tested. The filled line shall be allowed to stand until the pipe has reached its maximum absorption, but not less than 4 hours. After absorption, the head shall be re-established. The

amount of water required to maintain this water level during a 2-hour test period shall be measured. Leakage as measured by either the infiltration test or exfiltration test shall not exceed 100 gallons per inch diameter per mile of pipeline per day. The maximum allowable infiltration shall be increased ten percent (10%), over the one hundred (100) gallons per inch per mile per day allowed for infiltration, for each additional two feet (2') of average depth over a basic two feet (2') of head over the centerline of pipe; however, obvious and concentrated leaks (such as open joints, pinched gaskets, cracked barrels or bells, etc.) will not be allowed. When leakage exceeds the maximum amount specified, satisfactory correction shall be made and retesting accomplished. Testing, correction, and retesting shall be completed by and shall be the responsibility of the CONTRACTOR at no additional cost to the OWNER. See Tables 1 and 2 for PVC PIPE PRESSURE TEST and CONCRETE PIPE LOW-PRESSURE AIR TEST TIME respectively for pipe testing requirements. Sewer Pressure lines shall be tested for pressure and leakage in accordance with the standards for the type of pipe specified.

C. Test for Deflection: When flexible pipe is used, a deflection test shall be made on the entire length of the installed pipeline on completion of all work, including the leakage test, backfill, and placement of any fill, grading, paving, concrete, or superimposed loads.

Deflection shall be determined by use of a deflection device or by use of a spherical, spheroidal, or elliptical ball, a cylinder, or circular sections fused to a common shaft. The ball, cylinder, or circular sections shall have a diameter, or minor diameter as applicable, of 95 percent of the normal inside diameter of the pipe. A tolerance of plus 0.5 percent will be permitted. The ball, cylinder, or circular sections shall be of a homogeneous material throughout, shall have a density greater than 1.0 as related to water at 39.2 degrees F, and shall have a surface Brinell hardness of not less than 150. It shall be center bored and through bolted with a 1/4-inch minimum diameter steel shaft having a yield strength of 70,000 psi or more, with eyes at each end for attaching pulling cables. The eye shall be suitably backed with flange or heavy washer such that a pull exerted on the opposite end of the shaft shall produce compression throughout the remote end of the ball, cylinder or circular section. Circular sections shall be so spaced that the distance from the external faces of the front and back sections shall equal or exceed the diameter of the circular section. Failure of the ball, cylinder, or circular section to pass freely through a pipe run, either by being pulled through or by being flushed through with water, shall be cause for rejection of that run. When a deflection device is used for the test in lieu of the ball, cylinder, or circular sections described hereinbefore, such device shall be approved prior to use. The device shall be sensitive to 1.0 percent of the diameter of the pipe being measured and shall be accurate to 1.0 percent of the indicated dimension.

Deflection tests for each section shall be made by the Contractor in the presence of the Engineer between 30 and 45 days after completion of the trench backfill. Installed pipe showing deflections of 4.5 percent of the normal diameter of the pipe shall be retested by a run from the opposite direction. If the retest indicates a deflection in excess of the 4.5 percent, the suspect pipe shall be removed and replaced at the Contractor's sole expense.

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The Contractor shall also check each section for deflection within one year but no sooner than ten months after completion of construction and before the project bond is released. Installed pipe showing deflections of 5 percent of the normal diameter of the pipe shall be retested by a run from the opposite direction. If the retest indicates a deflection in excess of the 5 percent, the suspect pipe shall be removed and replaced at the Contractor's sole expense.

3.02 MANHOLES AND VAULTS

A. General: Manholes and vaults shall be water tight. Manholes shall be constructed of concrete or precast concrete rings, with cast iron, ductile iron or reinforced concrete frames and covers, as indicated. Manholes shall have a minimum of 12" road base compacted to 90% modified proctor. The invert channels shall be smooth and semicircular in shape conforming to the inside of the adjacent sewer section. Changes in direction of flow shall be made with a smooth curve of as large a radius as the size of the manhole will permit. Changes in size and grade of the channels shall be made gradually and evenly. The invert channels shall be formed directly in the concrete of the manhole base, or shall be built up with brick and mortar, or shall be half tile laid in concrete, or shall be constructed by laying full section sewer pipe through the manhole and breaking out the top half after the surrounding concrete has hardened. Pipe connections shall be made to manholes and vaults using water stops, standard o-ring joints, special manhole couplings, or shall be made in accordance with the manufacturer's recommendation. The CONTRACTOR's proposed method of connection, list of materials selected, and specials required, shall be approved prior to installation. The floor of the manhole outside the channels shall be smooth and shall slope toward the channels not less than 1 inch per foot nor more than 2 inches per foot. Free drop inside the manholes shall not exceed 1 foot 6 inches, measured from the invert of the inlet pipe to the top of the floor of the manhole outside the channels, and drop manholes shall be constructed whenever the free drop would otherwise be greater than 1 foot 6 inches.

B. Abandoning Manhole: The manholes for the abandoned sewer line shall have the grade rings removed and disposed of properly and be left in the existing location after filling in and compacting with sub-base at the existing subgrade. Finished grade over abandoned manholes shall match existing grade surrounding manhole opening. Contractor shall verify that all pipes leading into manholes that are to be abandoned are not currently in service or shall be diverted to new system upstream of the manhole in question.

C. Steps: Steps for precast manholes and cast-in-place vaults shall meet DFCM standard. Installation of rubber gasket joints between precast rings shall be in accordance with the recommendations of the manufacturer.

D. Frames and Covers: Unless otherwise indicated, the frames and covers shall be so set that the top of the cover will be flush with finished pavement grade or 2 inches higher than finished grade in unpaved areas.

3.03 CONNECTIONS TO EXISTING MANHOLES

A. Pipe connections to existing manholes shall be made in such manner that the finish work will conform as nearly as practicable to the essential applicable requirements specified for new manholes, including all necessary concrete work, cutting, and shaping.

3.04 MARKING AND TRACING TAPE

A. Pipe sizes 24" and smaller shall have placed 2 feet above the pipe a clearly labeled tracer and location tape along its entire length. Marking and Tracer Tape shall be paid as a cost to install the pipe. No separate payment shall be made.

END OF SECTION

SECTION 02731

SEWER SERVICE LATERALS

PART 1 GENERAL

1.01 SUMMARY

A. This Section covers installation of sewer service laterals for Center Street Sewer Replacement for Utah State Hospital.

1.02 RELATED WORK

A. Related work specified in other sections includes but is not limited to:

Section 01500 - Temporary Construction and Environmental Controls
Section 02221 - Excavation and Backfill for Buried Pipelines
Section 02730 - Sanitary Sewers
Section 15065 - Polyvinyl Chloride Pipe

1.03 MEASUREMENT AND PAYMENT

A. Measurement and Payment shall be as noted in Section 01150.

1.04 PERFORMANCE REQUIREMENTS

A. Vertical Cover: Unless indicated otherwise, vertical cover shall be a minimum of 30 inches for sewer service laterals. When subjected to light construction equipment loads, vertical cover shall be 4 feet.

B. Remove any section of pipe which is found to be out of alignment tolerance indicated, defective, or damaged. Relay or replace pipe without additional cost to OWNER.

1.05 PROJECT CONDITIONS

A. Contact owners of private property at least 72 hours prior to performing work on private property. Coordinate with private property owners to minimize inconvenience and maximize safety of the owners.

B. Provide reasonable access to owners of private properties.

C. Repair all private facilities damaged due to negligence of the CONTRACTOR that could have been avoided during performance of the work.

1.06 REFERENCES

A. The latest edition of the following publications form a part of this specification to the extent referenced. The publication is referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

A 48	Gray Iron Castings
A 536	Ductile Iron Castings
C 14	Concrete Sewer, Storm Drain, and Culvert Pipe
C 33	Concrete Aggregates
C 76	Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
C 94	Ready-Mixed Concrete
C 150	Portland Cement
C 260	Specification for Air-Entraining Admixtures for Concrete
C 443	Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
C 478	Precast Reinforced Concrete Manhole Sections
C 564	Rubber Gaskets for Cast Iron Soil Pipe and Fittings
C 924	Concrete Pipe Sewer Lines by Low-Pressure Air Test Method
D 3034	Type PSM Polyvinyl Chloride Sewer Pipe and Fittings
F 679	Polyvinyl Chloride Large Diameter Gravity Sewer Pipe and Fittings
F 1803	Polyvinyl Chloride Closed Profile Gravity Pipe and Fittings

UNIFORM PLUMBING CODE

PART 2 PRODUCTS

2.01 PIPE

A. Sewer lateral shall be minimum 4 inches in diameter and consist of PVC pipe ASTM D-3034 SDR 35 from the sewer main to 2 feet outside of the private residence.

B. Sewer pipe within 2 feet of the private residence and underneath the private residence shall consist of ABS material.

2.02 FITTINGS

A. Fittings for sewer service laterals shall be of the same material and class as the sewer service lateral and shall be installed with rubber gasket fittings.

PART 3 EXECUTION

3.01 INSTALLATION

A. CONTRACTOR shall install “wye” in sewer main to connect sewer service laterals. CONTRACTOR shall not break into the sewer main to make the connection. Connection of the sewer service lateral to the sewer main shall be 45 degrees from vertical from the centerline of the sewer main.

B. Sewer service laterals shall maintain a minimum positive slope of 2% from the sewer main to the point of connection to the private residence underneath the residence.

C. Cleanouts shall be installed at all bends in sewer service laterals complete with wye, pipe, and plug, at a location within 5-feet of each mobile home, and with a maximum spacing of 100 feet.

D. Pipe Laying General:

1. Pipe shall be protected during handling against impact shocks and free fall and the pipe interior shall be free of extraneous material.

2. Sewer service lateral pipe shall be laid and centered so that the service lateral has a uniform invert. As the work progresses, the interior of the sewer service lateral shall be cleared of all superfluous materials.

3. Before making pipe joints all surfaces of the portions of the pipe to be joined shall be clean and dry. Lubricants, primers, and adhesives shall be used as recommended by the pipe manufacturer. The joints shall then be placed, fitted, joined, and adjusted so as to obtain the degree of water tightness required.

E. As soon as possible after the joint is made, sufficient backfill material shall be placed along the pipe to prevent pipe movement off line or grade. Plastic pipe shall be completely covered to prevent damage from ultraviolet light.

F. CONTRACTOR shall install the sewer service lateral from the sewer main to 2 feet underneath the mobile home at the location designated by the owner of the private property. The lateral shall be installed to daylight at the connection point with the pipe not extending more that 4 inches above the ground surface.

G. CONTRACTOR shall contract with a licensed plumber to disconnect the mobile home from the septic tank and reconnect to the sewer service lateral installed by the CONTRACTOR.

3.02 EXCAVATION AND BACKFILL FOR SEWER SERVICE LATERALS

A. Excavation shall be performed to the lines and grades indicated. Excavated material not required or not satisfactory for backfill shall be removed from the site

B. Each trench shall be excavated so that the pipe can be laid to the alignment and grade as required. The trench wall shall be so braced that the workmen may work safely and efficiently. All trenches shall be drained so the pipe laying may take place in dewatered conditions.

C. CONTRACTOR shall provide and maintain at all times ample means and devices with which to remove promptly and to properly dispose of all water entering the trench excavation. Water shall be disposed of in a suitable manner without damage to adjacent property or without being a menace to public health and convenience. No water shall be drained into work built or under construction without prior consent of the ENGINEER. Dewatering shall be accomplished by well points, sumping, or any other acceptable method which will ensure a dewatered trench. Any dewatering method shall be subject to the approval of the ENGINEER.

D. Sewer service lateral trenches shall be backfilled to a level 12-inches above the top of the pipe with Pipe Zone Backfill Material for the type of pipe installed as defined in Section 02221 - Excavation and Backfill for Buried Pipelines. Such material shall be compacted to 90% minimum Modified Proctor density (ASTM D-1557) in six inch maximum lifts.

E. After the pipe has been installed and approved and the initial portion of backfill has been placed as specified above, backfilling of the remainder of the trench may proceed. All backfill above the protected pipe shall be carefully placed and compacted. Backfill placed above 12-inches over the pipe shall be compacted to 85% minimum Modified Proctor density (ASTM D-1557). No backfill material for the remainder of sewer service lateral trenches shall have rocks larger than 4 inches in diameter.

3.03 TESTING

A. All testing shall be the responsibility of the CONTRACTOR at no additional expense to the OWNER. The cost of pipeline testing shall be included in the cost for pipe installations.

B. Testing shall be in accordance with Section 02370 - Sanitary Sewers.

END OF SECTION

SECTION 15065

POLYVINYL CHLORIDE PIPE

PART 1 GENERAL

1.01 DESCRIPTION

A. CONTRACTOR shall furnish and install all pipe, fittings, closure pieces, supports, gaskets, jointing material, skids, seals, and appurtenances as shown and specified, and as required for a complete and workable piping system.

1.02 RELATED WORK

A. Related work specified in other sections:

Section 02730 – Sanitary Sewers
Section 02731 – Sanitary Sewer Laterals

1.03 REFERENCES

A. Work covered by this Specification shall meet or exceed the provisions of the latest editions of the following Codes and Standards in effect at the time of award of the Contract:

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C 900	Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In., for Water Distribution
AWWA M 23	Manual of Water Supply Practices - PVC Pipe - Design and Installation

1.04 SUBMITTALS

A. Submit manufacturer's affidavit certifying product was manufactured, tested and supplied in accordance with applicable references in this section together with a report of the test results and the date each test was completed.

1.05 MEASUREMENT AND PAYMENT

A. Polyvinyl Chloride Pipe shall be measured and paid for as noted in Section 01025, Measurement and Payment.

PART 2 PRODUCTS

2.01 POLYVINYL CHLORIDE PIPE MAIN

A. All polyvinyl chloride pipes intended for use as the sanitary sewer main shall be manufactured of material SDR-35 conforming to AWWA SDR-35 PVC materials and shall be Class 150 minimum.

B. All pipe sections shall be clearly marked to:

1. Identify manufacturer's name or trademark
2. Nominal pipe size and OD base
3. AWWA material code designation
4. Dimension ratio
5. AWWA pressure class
6. AWWA specification designation
7. Product record code.

2.02 POLYVINYL CHLORIDE JOINTS

A. All joints and accessories shall be as manufactured and furnished by the pipe supplier and have bell and spigot configurations, and have compatible pressure ratings with that of the pipe.

2.03 POLYVINYL CHLORIDE FITTINGS

A. All push-on fittings for pressure pipe from 4" through 10" shall meet AWWA Standard C907.

B. All solvent weld fittings shall meet ASTM D2466 or ASTM D2464 standards.

2.04 POLYVINYL CHLORIDE PIPE LATERAL

A. Laterals shall be of the same material

2.05 SAFETY TRACER TAPE

A. Safety tracer tape shall be a minimum of 2" wide and have a thickness of 5.0 mil, with a minimum of 50 gauge solid aluminum foil core. It shall be Safety Blue in color for culinary water pipelines and Safety Green in color for sanitary sewer pipelines and shall be clearly labeled with the word “WATER” or “SEWER” as applicable. Safety tape shall be as manufactured by Magnatec or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION OF FORCE MAIN, MANIFOLD AND LATERAL

A. All Polyvinyl Chloride pipe shall be installed in accordance with the "American Water Works Association Manual of Water Supply Practices - PVC Pipe - Design and Installation" (AWWA No. M23).

END OF SECTION